THE RELATIONSHIPS AMONG AFFECTIVE COMPLEXITY, COGNITIVE COMPLEXITY, AND SUBJECT-RATED MOODS

By

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TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii

LIST OF TABLES. vi

LIST OF ABBREVIATIONS vii

ABSTRACT. ix

INTRODUCTION. 1

Definition of Mood 1
Review of Literature 2
Rationale of the Study and Hypotheses. 53

METHOD. 59

Subjects and General Procedures. 59
Testing Materials. 60
Data Scoring Procedures. 66
Reliability of the Instruments 70
Data Analysis. 71

RESULTS 76

DISCUSSION. 101

APPENDIX A

Cover Sheet for First Experimental Session 124

APPENDIX B

Affective Grid 125

APPENDIX C

Desirability Check 130

APPENDIX D

Situations Grid. 131

Page

APPENDIX E

Bieri Grid 134

APPENDIX F

Appreciation and Invitation Sheet. 138

APPENDIX G

Cover Sheet for Mood Ratings 139

APPENDIX H

Wessman and Ricks Personal Feeling Scales. 141

APPENDIX I

Wessman and Ricks Daily Record of Personal Feelings. 148

LIST OF REFERENCES. 150

BIOGRAPHICAL SKETCH 158

LIST OF TABLES

Table		Page
1	Number and Direction of Significant Spearman Rho Correlations Between Two Complexity Measures and 64 Mood Variability Scores	78
2	Intercorrelations Between Two Measures of Complexity and 64 Mood Variability Scores	79
3	Number and Direction of Spearman Rho Correlations Between Two Complexity Measures and Four Categories of Mood Variability Scores	84
4	Number and Direction of Significant Spearman Rho Correlations Between Two Complexity Measures and 64 Mood Mean Scores	89
5	Intercorrelations Between Two Measures of Complexity and 64 Mood Mean Scores	91
6	Number and Direction of Spearman Rho Correlations Between Two Complexity Measures and Four Categories of Mood Mean Scores	95

LIST OF ABBREVIATIONS

Abbreviation	
A	Average values on the Personal Feeling Scales
ACR	Affective Complexity Reflected
CC	Cognitive Complexity
H	High values on the Personal Feeling Scales
HL	Remainder of subtracting a low from a high value on the Personal Feeling Scales
H-L	Same as HL
L	Low values on the Personal Feeling Scales
M	Means of H's, A's, L's, and H-L's on the Personal Feeling Scales
SD	Standard deviations of H's, A's, L's, and H-L's on the Personal Feeling Scales

Note: The following variables are Personal Feeling Scales

01	I.	Fullness vs. Emptiness of Life
02	II.	Receptivity Towards and Stimulation by the World
03	III.	Social Respect vs. Social Contempt
04	IV.	Personal Freedom vs. External Constraint
05	V.	Harmony vs. Anger
06	VI.	Own Sociability vs. Withdrawal
07	VII.	Companionship vs. Being Isolated
08	VIII.	Love and Sex

09	IX.	Present Work
10	X.	Thought Processes
11	XI.	Tranquility vs. Anxiety
12	XII.	Impulse Expression vs. Self-Restraint
13	XIII.	Personal Moral Judgement
14	XIV.	Confidence vs. Feelings of Inadequacy
15	XV.	Energy vs. Fatigue
16	XVI.	Elation vs. Depression

Note: Tables 2 and 4 use combinations of these abbreviations. SDH01 tells the reader that the variable is the standard deviation of 21 high ratings for Scale I: Fullness vs. Emptiness of Life, for each subject.

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A measure of affective complexity (AC) was developed in the theoretical context of George Kelly's Personal Construct Theory and Bieri's work in cognitive complexity (CC), and the utility of this measure in explaining mood level and variability was assessed. The measure of AC in this study was called Affective Complexity Reflected (ACR). The general hypothesis of the study predicted ACR and CC will be related to each other and to mood level and variability. An association was predicted between high AC (low ACR scores), high CC (low CC scores) and low mood variability.

The subjects in this study were 46 male and 29 female students who were enrolled in undergraduate psychology courses. The AC Reptest and Bieri's 10 x 10 Reptest were administered to assess ACR and CC. Mood was assessed by having students rate their moods on the Wessman and Ricks

Personal Feeling Scales (PFS) for 21 days.

The AC Reptest is a modification of Kelly's Role Construct Repertory Test. In Kelly's test the testee is presented with groups of 3 persons sampled from a list of 19 significant persons in his life and instructed to decide how two of them are alike and different from a third. This characterization is called the construct, and the opposite of the construct is called the contrast. The testee then indicates which other persons are described by the construct by placing a check in a column on the grid sheet. The process is repeated until 22 construct-contrast pairs are elicited.

For this study, constructs were elicited by asking students how two persons are alike but different from a third "in the way they make you feel." After completing the grid, students were asked to check which pole of the construct-contrast pair was most desirable. The grid was dimensionalized by reflecting rows having desirable poles on the contrast end. Reflection was achieved by replacing checks with voids and vice versa. Bieri's total number of matches of checks with checks and voids with voids (between rows) was the measure of ACR. CC was measured by using Bieri's 10 x 10 Reptest scored for total number of matches between rows.

The PFS are 16 10-point rating scales on which persons rate their highest level (H), lowest level (L), and a psychological "average" level (A), of mood each day. Mean

within-day variability (H-L) was assessed by subtracting L ratings from H ratings over 21 days of ratings. Mean mood level (ML) was assessed by computing means of H, A, and L across 21 days for each of the 16 scales. Mood variability (MV) was assessed by computing standard deviations (SD) of H, A, L, and H-L scores across days.

ACR scores were stable over 3 weeks for women ($r = .81$, $p < .001$) but not for men ($r = .38$, $p > .05$). CC was stable for men ($r = .79$, $p < .001$) and for women ($r = .84$, $p < .001$). ACR and CC were related for women ($r = .66$, $p < .001$) but not for men ($r = .09$, $p > .05$).

Spearman rho rank order correlation coefficients were computed between both ACR and CC, and mean mood level (ML) and mood variability (MV) scores. High AC (low ACR scores) was associated with low MV for men but not for women; high CC (low CC scores) was associated with low MV for women and high MV for men; high AC was associated with low ML in women and was not related to ML in men; and high CC in women was related to low ML, but no relationship was observed for men.

Results were compared with those of Wessman and Ricks who developed a measure of AC by factor analyzing mood ratings for individuals, and assessed it by correlating AC scores with ML and AV scores on the Elation vs. Depression scale of the PFS. Both studies found AC was related to the MV score for men but not for women. ACR was related to ML for women but AC was not. ACR and AC did not relate to ML for men in either study.

The results suggested that ACR is a measure of AC. The relationships between CC and ACR results were discussed in terms of differential preferences for use of AC and CC in males and females.

INTRODUCTION

The purpose of this study was to investigate the relationship of personality structure to normal variations of mood states. Moods are a part of daily life and seem to be an important part of human experience. This pervasive aspect of personality has recieved little scientific scrutiny when compared to extreme emotions or pathological states found in the manic-depressive, cyclothymic personality, and other affective disorders. When extremes of affect are expressed, they rarely escape our notice, but average or "okay" feelings, while probably typical, have received little research attention. Perhaps this study will add information to the small, but rapidly growing, body of research dealing with mood variability.

Definition of Mood

Most of the words we have to describe emotional experience are in common use in the language. Thus far, investigators in this area have failed to achieve more precision in defining words like emotion, mood, and temperament than exists in general usage. Nowlis (1965) has presented a hierarchical model which places emotion first, with mood and temperament following. Emotion is recurrent and of

short duration. Mood is also recurrent but is characterized by longer duration. Temperament has the longest duration and is conceived as an almost permanent disposition.

Wessman and Ricks (1966) have briefly summarized and distilled the common core of thought from investigators of diverse theoretical persuasions. They concluded

> that moods are basic psychological dispositions of subjective and objective importance. Moods may be prolonged or they may be fleeting, but they are not inconsequential. Their character is intimately related to the way a man feels and behaves. One is different in every mood. They are matters both of general characterological significance and of dynamic change. That is, moods are expressions of the individual's continuing total life condition and also reflect and influence changes in his ongoing involvements. In short, these theories would lead one to anticipate that mood characteristics should prove to be highly revealing features of personality. An individual's dominant moods and the conditions and nature of their changes should have basic relevance to his life. (p. 22)

The review of research demonstrating the effects of moods and events upon each other will provide evidence that personality structure is related to differences in the amount of mood variability that individuals will avow.

Review of the Literature

This review will be focused on normal variations in mood, but since the majority of mood studies deal with the effects of experimental operations on moods, these studies will also be briefly summarized. Two major types of studies which demonstrate this approach have used situational variables and drugs to induce mood changes. Examples of these

two groups of studies will be presented as the first two sections of this review. The third section will deal with studies which demonstrate the effects of mood level on a wide variety of performance tasks. The fourth section will be focused on normal mood variation in relationship to personality structure. In the last section, evidence will be presented supporting the use of complexity as a personality structure index in this study.

Mood Induction Effects on Mood

Investigators of affective states have frequently attempted to induce mood states in research subjects, so that other data could be collected. Zuckerman (1960) developed an Affect Adjective Checklist (AACL) for measuring anxiety by selecting 61 adjectives which might indicate anxiety. College students were asked to check adjectives that applied to them, such as afraid, fearful, and tense. The items were screened by assessing the performance of (a) psychiatric patients rated high on anxiety and normal students rated low on anxiety and (b) normals in a hypnotically induced anxiety state. Items which seemed promising were administered to students at the beginning of every other class meeting in a university setting. Zuckerman found that more anxiety adjectives were checked on days for which examinations were scheduled than on nonexam days. A one-week test-retest reliability coefficient was computed for two different versions of the AACL. The general form asked students how they felt in general while the today

form asked them how they felt on that day. The general coefficient was .68, and the today coefficient was .31, which suggested that the two instruments measured both stable (general) and fluctuating (today) aspects of anxiety. The correlation between the two measures was .43, indicating that different aspects of mood are tapped when time frame instructions are varied. Consistent with Nowlis' (1965) position, it could be hypothesized that the today form measures mood while the general form is an index of temperament.

Plutchik (1966) used the examination setting to assess student performance on eight rating scales which measured emotions described as the experience of being fearful, angry, disgusted, sad, surprised, expectant, joyful, and agreeable. Psychology students rated each emotion on a 5-point scale ranging from: "do not feel the mood at all" to "feel the mood very strongly." On test days, increases were noted over nontest days on fearful and expectant, and decreases were noted on joyful and agreeable.

Schachter and Singer (1962) studied the effects of social, cognitive, and physiological treatments on reported emotional experience. They hypothesized that emotion is a product of physiological arousal, set of the person, and social influences in the environment. They manipulated each of the variables by injecting either epinephrine or a placebo of saline solution in college students and by giving instructions to inform, misinform, or not to inform students

injected with epinephrine as to physiological effects to be expected. A "stooge" was introduced into the setting to induce feelings of either euphoria or anger in the college students. These feelings were measured on two 5-point self-rating scales. In the euphoria condition, self-rated euphoria closely paralleled behavior ratings secretly made by the experimenter. In the anger condition, this parallel was not observed. Students did not know they were being observed, and they showed behavioral indices of anger but did not show anger on the self-report measure. Schachter and Singer found that students were afraid to lose extra credit points they had been promised for participating in the experiment if they showed anger on the self-report measure of anger. The experimenters reported that the fear of losing points suppressed expressions of anger on measures that subjects expected the experimenters to see. Thus, mood scores were influenced by experimental conditions in planned and unplanned ways.

Lazarus and his colleagues have reported the effects of ego defenses and stress situations on self-rated mood and physiological indices of stress (Speisman, Lazarus, Mordkoff, & Davison, 1964; Lazarus & Alfert, 1964). They used heart rate, skin conductance, and an early Nowlis mood scale, the Nowlis Adjective Check List of Mood (Nowlis & Nowlis, 1956), as stress indicators. The Nowlis check list measured Concentration, Aggression, Pleasantness, Activation, Egotism, Social Affection, Depression, and Anxiety. These

factor analyzed scales contain adjectives to which the person responds: definitely does not apply, not sure, slightly true, or definitely true. The participants saw a film depicting a ceremony in which a boy is held down while his penis is cut with a piece of sharpened flint. Sound tracks were added to enhance intellectualization, denial, and a control track (trauma) was used to emphasize the pain and danger. A silent track provided a no-sound control.

When mean levels of heart rate were compared among the four sound tracks, no significant differences were found. For skin conductance, the trauma track produced mean levels which were significantly higher than the two defensive tracks (denial and intellectualization). However, many more differences were found when skin conductance level was sampled at points in the film where arousal levels were presumed to be high.

Looking at the mood data, Speisman et al. found that the trauma track, when compared to the intellectualization track, produced less Pleasantness, less Activation, more Egotism, less Social Affection, and more Depression, all of which are summarized as more disturbance with the trauma track. The trauma track differed from the denial track in producing less Pleasantness and less Social Affection. The trauma track, when compared to the silent film alone, produced more Aggression, less Pleasantness, less Social Affection, and more Depression.

The mood scales did show predictable differences

between different sound tracks although differences were generally small. The authors concluded that, like mean levels of skin conductance, mood ratings did not show the great sensitivity of skin conductance levels taken at selected stressful points in the 17-minute film.

In the second study, Lazarus and Alfert (1964) used a similar design and reported similar results. They also compared high deniers and low deniers as classified by the K and Dn scales of the Minnesota Multiphasic Personality Inventory (MMPI). In comparing the results of heart rate, skin conductance, and mood ratings, they observed that

> high deniers refuse to admit disturbance verbally but reveal it autonomically while low deniers are apt to say they are more disturbed while showing less autonomic reactivity. This is, of course, exactly what the concept of denial means, and the above finding tends to support the validity of these personality measures. (p. 202)

Nowlis (1965) has discussed the development of his scales in great detail and also provided a review of other similar studies in which experimenters have created conditions designed to produce mood changes.

Drug Effects on Mood

A large number of mood studies have been focused on the effects of new drugs (Uhr & Miller, 1960; Nowlis, 1965). Perhaps the most exhaustive and informative research program has been conducted by Wendt and his colleagues (Wendt, Cameron, & Specht, 1962; Cameron & Wendt, 1964; Cameron, Specht, & Wendt, 1965, 1967a, 1967b, 1967c, 1967d, 1967e) at the University of Rochester. Wendt and Cameron (1961)

described the basic ethical, legal, and technical problems in such research and pointed out how their series of studies provides more information than others. As many as 8 of the 13 drugs under investigation may be going through replication in a given study.

In the basic strategy, students fill out a form of the Nowlis Mood Adjective Check List (MACL) (Nowlis, 1953). The student checks each of the 130 mood adjectives if a word possibly applies to him and double checks if the word definitely applies to him. Students then receive placebo, dramamine, aspirin, caffeine, etc., and return two hours later to retake the MACL as well as a 33-item forced-choice MACL. The student compares present mood state with mood state before taking the drug, indicating if he presently feels more like the adjective or less like the adjective when compared to his predrug state. With this procedure, each student takes a number of drugs presented in mixed order over a period of days. With this repeated measurement approach, Wendt has demonstrated differences in mood resulting from very small changes of dose level as well as interesting interactions between drugs.

Wendt and Cameron (1961) have noted that occasionally they encounter a subject who checks only a few or as many as 100 of the 130 adjectives. These students are routinely eliminated as subjects, since it is predicted that they will fail to show meaningful changes on these mood measures. Such a procedure is questionable in that eliminating ex-

treme cases from the sample limits generalizations to persons who presumably have average sorts of feelings. Since drugs are frequently prescribed for persons outside normal limits on various physical and psychological parameters, it seems imprudent to eliminate such persons from drug research studies.

An alternative strategy is to isolate these individuals from the main sample and regard them initially as intensive case studies requiring a variety of assessment measures. Should trends appear over cases, these individuals might be studied as a special group. These people appear to be an interesting group to study outside the context of drug research. Students who consistently check few or many mood adjectives may presumably be different in other ways that tests of personality could identify.

Mood as a Covariate

As noted earlier, Wendt and Cameron (1961) excluded students when a base or ceiling effect might obscure results of drug action. A number of other investigators have encountered the problem of mood level as a confounding variable or important covariate. Rickels and Clyde (1967) used the Clyde Mood Scale to evaluate the effects of Librium. The Clyde Mood Scale (CMS) consists of 48 adjectives which the patient chooses if applicable to him. The CMS yields six factors: friendly, aggressive, clear thinking, sleepy, unhappy, and dizzy. Librium patients showed more declines on aggressive and increases on friendly. Initial levels of

mood were important in that patients high on sleepy and dizzy factors showed decreases with Librium treatment while patients low on dizzy and sleepy factors showed increases with treatment.

Dinnerstein and Halm (1970) also used the Clyde Mood Scale in a covariance design to study placebo, aspirin, and effects of instructions. College students taking aspirin under expectations to receive an "energizer" showed expected changes more than students taking a placebo. Students receiving aspirin as a "tranquilizer" also showed expected effects more than students taking a placebo did. The authors suggested that marihuana investigators who fail to get expected effects with neutral instructions (Weil, Zenberg, & Nelson, 1968) should use "energizer" and "tranquilizer" instructions in future studies.

Initial mood level did show a significant main effect in the analysis. Premeasure mood level was chosen as being "the most potent source of between-S variance" (Dinnerstein & Halm, 1970, p. 311), and thus mood level was used, instead of subjects, as a factor. However,

> the significant overall effect of premeasure rank [of six mood scores] was theoretically trivial, reflecting the statistical fact of regression on difference scores [between before and after mood scale scores] in a test-retest procedure. The significant F merely justified the choice of a statistical design which removed the variance from the error term. (p. 311)

While mood levels may have been "theoretically trivial," Dinnerstein and Halm (1970) at least recognized the poten-

tial importance these levels may have on responses to drug, placebo, and instruction variables.

Reynolds (1969) studied mood in women experiencing menstrual difficulties. On a scale ranging from "very low" to "very cheerful," 87 women rated their moods for four weeks. At the end of four weeks they filled out a questionnaire which asked if they had experienced broad classes of events such as vacations, worries, changes in job, etc. They were then asked to recall their moods during these events. Women who filled out these scales during their "complaint" period attached more positive mood scores to these experiences than did women who rated events while in their noncomplaint period. Reynolds found that daily moods were lower during these periods, but no significant difference was found between mood levels attached to events which occurred on complaint or noncomplaint days. Thus, when people rated events while in low moods these events were remembered more favorably. These ratings again demonstrate the importance of mood level on performance.

In another study of recall, Holmes (1970) asked students to record pleasant and unpleasant experiences daily for seven days and rate these experiences on a 9-point scale ranging from "very pleasant" to "very unpleasant." A week after turning in this data, the students returned and were asked to recall as many experiences as they could. Experiences which decreased in feeling intensity were less likely to be recalled than those that retained the same

intensity. Also, unpleasant experiences decreased in intensity more than pleasant experiences. These results demonstrated that mood affects memory to such an extent that the reliability of case history data is questionable (Reynolds, 1969). It is also suggested that mood researchers need to collect data with a set such as "how I felt today," rather than by dealing with longer time spans.

Constantinople (1967) hypothesized that happier students should see the college as helping in the attainment of important goals. She used the Wessman and Ricks (1966) 10-point Elation vs. Depression scale to assess each student's average level of happiness during the current academic year. The 6-week test-retest reliability coefficient was .85. The predicted relationship was observed: happier students perceived the university as helping in the attainment of important goals. An alternative hypothesis that students who attain goals are happier was entertained but not directly tested. It is interesting to note that the Wessman and Ricks measure was used, rather than the Mood Adjective Check List of Nowlis, who guided this research. The Wessman and Ricks scales offer the advantage of providing 10 scale positions which are anchored to feeling statements. The Nowlis MACL requests a person to check a feeling adjective if it possibly applies to him and double check it if it definitely applies. A "definitely does not apply" category and a "not sure" category have also been used, creating a 4-point scale which lacks the precision of the 10-point scale.

Velton (1968) developed a mood induction task which required 100 female students to read 60 self-referent statements designed to produce either elation, depression, or no change. These treatments did produce expected results on the Zuckerman, Lubin, and Robins (1965) Multiple Affect Adjective Check List (MAACL) Depression scale as well as on writing speed, decision time, and word association times. Hypnotic suggestibility was an important covariate, but pretreatment mood level was not. The pretreatment measure of mood level was the time it took a student to judge which of two equally weighted tins was heavier in each of the five pairs of tins. Such a measure bears little relationship to existing mood state scales and may best be regarded as an experimental measure of ambivalence.

Gouaux and Gouaux (1971) used Velton's (1968) mood induction tasks with 114 female students, but semantic differentials were used to measure the pretreatment and posttreatment effects, which were significant. The dependent variable was lever pull time in acquisition and extinction, using social reinforcers (praise) and nonsocial reinforcers (money). Affective-state main effects were significant in both acquisition and extinction (depressed students were slower). A proposed interaction between affective state and type of reinforcer was supported in extinction but not in acquisition; i.e., elated students were faster than depressed students in extinction when social reinforcers were used, but no differences were observed when nonsocial rein-

forcers were used. These results were considered as limited support for the hypothesis that elated students will welcome social approach behavior whereas depressed students will not.

Nadien, Schaeffer, and Schmeidler (1969) noted that previous research was contradictory in the area of reading speed, comprehension, and eye dominance. Students were asked to indicate how they usually felt and how they now felt on four scales with extremes labeled despair-ecstasy, raging-loving, perfectly secure-panic, joyously social-insulated withdrawn. Algebraic sums indicated whether students were in positive or negative moods. In the negative mood group, there was no relationship between reading speed and comprehension (r = .17). In the positive mood students, the relationship was strong (r = .72). A number of other differences were also observed. "The data suggest forcibly the need to examine Ss' feelings in the test situation to understand their scores. They also suggest that Es who establish different moods in their Ss may fail to replicate each other's results" (p. 278).

Griffitt (1970) postulated that evaluation of a person is a linear function of the proportion of stimuli with positive reinforcement properties associated with that person. These reinforcing properties evoke affective responses which lead to verbal behavior (statements of liking or disliking). After reviewing research on riots, Griffitt noted that most riots occur when temperatures are high, and he postulated high temperature as a negative affect-acti-

vating event. Using a temperature-controlled chamber, he exposed groups of introductory psychology students to either hot or comfortable temperature and humidity situations. All students rated themselves on the dimensions "comfortable-uncomfortable, bad-good, high-low, sad-happy, pleasant-unpleasant, negative-positive," at the beginning and end of the session. The students had completed a 44-item attitude questionnaire before the session began. During the session the student rated the attitude questionnaire of a "stranger" who agreed with either 25% or 75% of his attitudes. The stranger questionnaire had been produced by Griffitt. The results showed that normal temperature resulted in higher affect, students with higher affect rated strangers' attitude scales more positively, and high-similarity strangers were evaluated more positively than low-similarity strangers. Mood appears to have an effect on the way we evaluate others.

Lamont (1972a, 1972b) noted that the Rotter I-E scale (Introversion-Extraversion) had a correlation of .35 with the MMPI Depression scale and .44 with the Zung Self-Rating Depression scale, suggesting that in psychiatric patients, depression was associated with external locus of control of reinforcement. This finding contradicts the theories of Schwartz (1964) and the verbalizations by patients which suggest that depressed patients feel they are responsible for their fates rather than being helpless pawns.

Lamont noted that high E scores could be the result of the pessimistic tone of the E items. Lamont (1972b) con-

structed an I-E scale of 12 items written to reflect low, neutral, and high mood. The 20 highest and 20 lowest scorers among 123 undergraduates who took the Zung Self-Rating Depression scale were compared on the I-E scale. For both groups, endorsement of items was a direct function of mood level of I-E items rather than of I-E content.

In the second study, Lamont (1972a) had undergraduate psychology students rate the mood level of Rotter's (1966) 46-statement, forced-choice I-E scale, and he found the E items were rated lower in mood than I items, as had been previously surmised. Lamont also constructed an I-E scale of 15 pairs of I and E statements matched on social desirability. The items were written to reflect low, neutral, and high mood, and had high face validity as I or E statements. Using scores from the Zung scale for 197 undergraduates, the highest and lowest 19 students were used in the analysis, as well as 19 students who scored within one point of the mean.

Each group endorsed items with mood level near the level of depression of the group, which resulted in a correlation of -.84 between Zung scale scores and the tendency to endorse items as a function of item mood level. Lamont postulated a mood response set which may operate on test items dealing with self-evaluation or assessment of present or future outcomes. He suggested caution in interpreting Rotter I-E scale scores, especially in populations where high levels of depression may be expected.

The studies cited here have suggested that mood is a pervasive aspect of personality. Data suggest that a person's mood level can significantly affect his performance on a wide variety of tasks and, presumably, on many other tasks where mood effects have not yet been assessed. Prudent researchers may well consider screening persons on mood level, or including a mood assessment procedure, within the design of experiments which measure human performance. However, the assessment of normal mood and its variation has progressed slowly, and no large body of data exists to inform the researcher of the basic parameters of normal mood level and variation.

The work of Gurman (1973) provides a final example of the effects of mood on human performance. Gurman rated tapes of therapy sessions on gross facilitative functioning and selected three therapists who scored high and three therapists who scored low on these empathy, warmth, and genuineness scales. Before each session the therapist and client filled out five of the Wessman and Ricks (1966) Personal Feeling Scales (see Appendix H). The 16 scales of the PFS measure 16 different moods. Each scale asks the person to select one of 10 statements which best reflects his feeling on each mood scale. The Wessman and Ricks instructions require the person to select one statement on each scale which reflects his high point of the day, one which reflects his low point, and one which reflects a psychological "average" for the day. Gurman selected scales

to measure Elation vs. Depression, Harmony vs. Anger, Own Sociability vs. Withdrawal, Energy vs. Fatigue, and Tranquility vs. Anxiety. He asked therapists and clients to rate themselves as they felt right now. After each session, clients filled out the Relationship Inventory, a 30-item true-false scale designed to tap the clients' perception of therapist-offered empathy, warmth, and genuineness. Tape recordings of the sessions were also rated for therapist-offered empathy, warmth, and genuineness.

Gurman found that high-facilitative therapists offered higher levels of empathy, warmth, and genuineness when in relatively negative moods than in relatively positive moods, a finding contrary to predictions. Low-facilitative therapists offered higher therapeutic conditions under positive moods than under negative moods. In trying to explain the unanticipated results, Gurman hypothesized that high-facilitative therapists anticipate the possible negative effects of low moods and prevent these effects or that such therapists are better able to enter the client's "down" world and are reinforced for doing it well.

In looking at the effect of patient mood on offered conditions, Gurman found no significant differences on tape-rated facilitative conditions, although clients of low-facilitative therapists perceived higher levels when clients were in low moods than when in high moods. In patients of high-facilitative therapists, client mood did not affect perception of offered conditions. Gurman suggested that

this misperception is a function of inaccuracy in evaluating interpersonal relationships. Theory suggests that patients of low-facilitative therapists should be expected to be more inaccurate.

In a companion study, Gurman (1972) asked 12 therapists to rate their moods for 14 days on the five PFS scales listed above. Therapy tapes were rated for warmth, empathy, genuineness, self-disclosure, and gross facilitative interpersonal functioning. A total mood score was computed by averaging the means of average ratings for all five scales.

Significant positive rank-order correlations were obtained between the following facilitative condition variables and means of "average" ratings on the PFS scales. Empathy was related to Elation vs. Depression. Warmth was related to Elation vs. Depression, Tranquility vs. Anxiety, Own Sociability vs. Withdrawal, and overall mood level. Genuineness was related to Elation vs. Depression, Tranquility vs. Anxiety, and overall mood level. Gross functioning was related to Elation vs. Depression, Tranquility vs. Anxiety, Own Sociability vs. Withdrawal, and overall mood level. The range of these significant correlations was .40 to .59 (gross functioning and Elation vs. Depression).

Standard deviations of the average values were computed for each PFS scale. Variability of Tranquility vs. Anxiety was positively related to empathy, warmth, genuineness, self-disclosure, and gross functioning. Variability of Energy vs. Fatigue was positively related to warmth and self-disclosure.

The range of significant correlations was .43 to .71 (Tranquility vs. Anxiety and warmth). Gurman suggested that therapists who are happy with their lives are better able to understand and respond to clients. The findings concerning the variability of Tranquility vs. Anxiety suggested that therapists who can identify and accept feelings in themselves are better able to identify, accept, and respond facilitatively to feelings in clients.

Gurman's research has demonstrated that mood is an important aspect of the therapy relationship, an aspect whose effects are not totally in line with clinical hunches. In a relationship characterized by emotional experience and emotional expressions, mood may be expected to greatly affect the process and end results. The use of mood assessment in future investigations of therapy may be a fruitful addition.

The work of Reynolds (1969) on mood and memory also has important implications for clinical endeavors. When patients remembered events while in low moods, the event was remembered more favorably then when the patient was in a high mood. This result may have broad implications for interpreting verbal reports elicited in history-taking procedures.

All of the research presented in this section suggests that researchers and clinicians may profit from investigations of mood effects in their domains of interest. The research to be presented in the next section will provide some background information that may facilitate that investigation.

Mood and Personality

Much of the research cited has demonstrated the pharmacological and psychological ingenuity of researchers' efforts to change moods. This approach has certainly supplied a vast amount of new knowledge in psychology. The experimental approach has moved psychology from the armchair to the laboratory, but in the area of mood variability, the move has been so rapid that naturalistic predecessors to rigorous experimental control have been slighted. Thus, the "what is" of mood has been largely passed over in favor of "what can be." Researchers who have looked at mood as a "what is" have treated mood level mostly as a "nuisance variable" which must be controlled for by the use of statistical manipulations like covariance analysis. However, such a treatment assumes that mood is either a very stable aspect of personality or that a reasonably good single estimate of mood may be achieved for these statistical procedures. The research to be presented on normal mood variation suggests that neither assumption is particularly valid.

Sidman (1960) has discussed the difficulties with variable behavior in baseline conditions.

> In such cases, the experimenter, if he is interested in experimental rather than statistical control, will take a step backward. He will temporarily give up his immediate goal and instead begin an investigation of the variables that influence his baseline conditions. (p. 34)

A few studies have attempted to assess normal mood and its

variation over time. Others have investigated the relationships among mood level, variability, and other psychological and behavioral indices of personality.

The earliest study of this type investigated the relative amounts of pleasure and unpleasure in our daily lives. Flügel (1925) published results of studies conducted around 1917 on nine persons who rated moods over a period of 30 days. All students had been trained in psychology, which at the time probably included introspective methods. They filled out a log in which they listed time of day, current emotional experience, the duration of that experience and its intensity, on a 7-point scale ranging from "intense unpleasure" (-3), through "indifference" (0), to "intense pleasure" (+3). These students spent 50.1% of their time in pleasurable states, 22.2% in unpleasurable states, and 27.8% in indifferent states. There was wide variation in these percentages among the group. Those who experienced extremes of pleasure also tended to experience extreme unpleasure (r = .45). Those students who experienced intense feelings tended to have less pleasure in their lives. This finding is the first experimental evidence of a relationship between hedonic level and hedonic variability.

Vincent Nowlis (1965) has summarized work dealing with the Mood Adjective Check List (MACL) (Nowlis, Nowlis, Riesen, & Wendt, 1953; Nowlis, 1953, 1959, 1961, 1963; Nowlis & Green, 1957, 1964; Nowlis & Nowlis, 1956; and others). Much of this work was reported to the Office of

Naval Research in technical reports no longer available from the U.S. Government Printing Office. Nowlis postulated four bipolar dimensions of mood: activation-deactivation, pleasantness-unpleasantness, positive social orientation-negative social orientation, and control-lack of control. A list of 120 mood adjectives and 10 words to monitor physical status and test-taking attitude were administered to 450 college men at the beginning and end of six one-hour experimental sessions. The men were asked to respond to each adjective in one of four ways: "definitely feel it, slightly feel it, word is unclear or cannot decide, definitely does not apply." This created a 4-point scale with values of 3, 2, 1, and 0.

Various combinations of the 12 data sets were entered into five factor analyses. Ten factors were extracted in each of the analyses. Aggression, Anxiety, Surgency, and Concentration were found in all five analyses; Fatigue, Social Affection, Sadness, and Skepticism, in four analyses; Egotism, in three analyses; Elation and Nonchalance, in two analyses; and Vigor, in one analysis; making a total of 12 factors. Other researchers have tended to find the first six factors listed here, plus a few of the other six, leading Nowlis to conclude that at least 12 factors do exist. Nowlis (1965) found these factors were unipolar, in contrast to hypotheses of bipolarity he had made and to wide spread assumptions of bipolarity of affect dimensions.

Meddis (1972) has offered a tentative explanation of

these surprising findings. Commonly used response categories include two acceptance categories (definitely feel, slightly feel), one rejection category (definitely don't feel), and a confusion category (can't decide), which should properly be considered as missing data. Meddis hypothesized that the unbalanced categories created a bias against finding bipolar factors and created four symmetrical categories: "definitely feel, slightly feel, do not feel, definitely do not feel."

Meddis administered the 130-word MACL to 154 students. Half of the sample responded with Nowlis categories; the remaining half used the new "control" categories. A sample of 38 adjectives was chosen to reflect the original four dimensions postulated by Nowlis. Responses for each response style were factor analyzed separately. Two nearly identical sets of four factors were extracted, but one important difference emerged; the first two control factors had three strong negative loadings each, while the Nowlis factors had only one strong negative loading on the first factor.

The two bipolar factors obtained using the symmetrical control ratings suggested that Nowlis' failure to find bipolar factors may be due in part to methodological biases against such results. These findings do not negate the value of the MACL; they point to possible improvements of the MACL and, more importantly, may serve to clarify the nature of affective personality structure.

D. Nowlis and Cohen (1968) used MACL reports to study three college roommates much the way Flügel did some 40 years before, but the data were limited to one day. MACL's were filled out about once per hour. One student reported increases in pleasantness and depression at the same time. He reported feeling good about talking to his girl friend and feeling sadness concerning the great distance which separated them. Another student reported increases in deactivation and activation shortly before retiring. The authors suggested that a unipolar conception of mood factors (V. Nowlis, 1965) was supported by these data.

Nelson (1971) studied students over the course of an academic year by administering mood scales each Monday to random groups of students. He found predictable changes as exam weeks and major social events occurred, and a tendency for students complaining of upper respiratory infections to report less mood intensity.

Benedek and Rubinstein (1942), Moos, Kopell, Melges, Yalom, Lunde, Clayton, and Hamburg (1969), and Reynolds (1969) have studied the relationship between menstrual cycle and mood. Positive moods and energy were at their lowest and tension at its highest in the days immediately preceding menses onset. A few days later these positive moods increased along with increased interest in sex until ovulation. Corresponding decreases in aggression, tension, and anxiety were also observed during these days. Following ovulation, the positive feelings decreased gradually until onset of menses.

Wessman, Ricks, and Tyl (1960) and Wessman and Ricks (1966) have reported the results of an investigation of mood level, mood variability, and personality characteristics of 17 male undergraduates attending Harvard and 21 female undergraduates attending Radcliffe. Since the present investigation is largely based on the theoretical formulations, methods, and results of the Wessman and Ricks study, a detailed presentation of their work is considered essential.

The basic aims of the research were to collect data on levels and variability of mood states and to relate these variables to a wide variety of personality measures. Daily mood ratings were made for 42 days on the Wessman and Ricks (1966) Personal Feeling Scales (PFS, in Appendix G) and recorded on the Daily Record of Personal Feelings (Appendix I). Indices of mood level and variability were derived from these ratings and correlated with the personality measures.

There are several important aspects of the study which merit discussion before the results can be interpreted meaningfully. The students were unusually bright, academically talented, and more motivated than most students in psychological research. Tyl was president of her dormitory and recruited female friends at Radcliffe in order to complete an honors thesis. The final sample included 21 girls (of 25) who provided enough data. Harvard students served in a three-year study of personality and were selected partially on the basis of scores on a self-report measure of avowed happiness-unhappiness. The upper and lower

quartiles of that distribution are represented in the ratio 2:1 with respect to the two middle quartiles. Harvard students were paid at rates set by the student employment office and also knew that participation would help a classmate complete his honors thesis. The students received $10.00 for completing all tests and 35 days of mood data plus a $5.00 bonus if they turned in perfect records without missing a day. Of the 18 students who began the study, 17 finished enough data to be included in the final sample, and 13 students earned the bonus by supplying complete data. Wessman and Ricks also had ample time to establish rapport with students in three years of repeated contacts with them.

The students provided mood data by rating themselves on the Personal Feeling Scales (PFS) developed by Wessman and Ricks (1966). The PFS are 16 10-point rating scales designed to assess mood level in the following areas: I. Fullness vs. Emptiness of Life; II. Receptivity Towards and Stimulation by the World; III. Social Respect vs. Social Contempt; IV. Personal Freedom vs. Constraint; V. Harmony vs. Anger; VI. Own Sociability vs. Withdrawal; VII. Companionship vs. Being Isolated; VIII. Love and Sex; IX. Present Work; X. Thought Processes; XI. Tranquility vs. Anxiety; XII. Impulse Expression vs. Self-Restraint; XIII. Personal Moral Judgement; XIV. Confidence vs. Feelings of Inadequacy; XV. Energy vs. Fatigue; XVI. Elation vs. Depression. The 10 points of each scale are anchored with self-descriptive statements designed to promote con-

sistent reporting and to facilitate comparisons among people and among scales. Inspection of the Personal Feeling Scales reveals that the scale position 5 is just below the neutral position on all scales while 6 is just above neutral.

Moods were rated and recorded on the Daily Record each evening before retiring. The students recorded highest level (peak), lowest level (through), and a psychological average for each of the scales which resulted in 48 ratings for men and 33 ratings for women. Radcliffe students completed the Personal Feeling Scales one year earlier than the Harvard sample when the PFS did not include Scales III, IV, VII, XII, and XIV.

Measures of hedonic level were computed by taking the means of all highs, averages, and lows for each of the scales. The primary hedonic level indicator was the mean for all the "average" ratings on Scale XVI: Elation vs. Depression (MA16). Two variability calculations provided indices of within-day and between-day variability. Within-day variability was the mean of the results of subtractions of lows from highs summed across days. There were 16 of these indices, the main one being the mean of high-minus-low ratings on Scale XVI: Elation vs. Depression (MHL16). Between-day variability was computed by taking the standard deviation of ratings across days for each of the 48 ratings. The main indicator of variability-stability was the standard deviation of "average" ratings on Scale XVI: Elation vs. Depression (SDA16).

Students in both groups received two packets of testing materials to be filled out in an elated and a depressed mood. Each packet contained a self-ideal Q-sort, the Rosenzweig Picture-Frustration Test (P-F Test), and for male students a Cattell 16 Personality Factor Test. As hypothesized, there was a closer correspondence of self and ideal Q-sorts in elation as compared to sorts done in depression; self changed more than ideal between sorts; and self-concept was more favorable in elation.

Wessman and Ricks predicted fewer intropunitive and more extrapunitive P-F Test responses in elation than in depression. For females the opposite results were found. For males no clear trends emerged. Wessman and Ricks noted that this finding contradicts the popular notion that in depression, one's hostility is directed inward. They hypothesized different processes in normal and pathological forms of depression.

Before presenting the rest of the Wessman group's research, some follow-up research by Clum and Clum (1973) will be presented which also addresses the relationship between mood and aggression. Clum and Clum correlated scores from the Defense Mechanism Inventory (Gleser & Ihilevich, 1969) with the means of 30 days of mood ratings on seven scales of the PFS. The inventory measured the defense mechanisms of turning against other, turning against self, projection, intellectualization, and reversal.

Each mechanism was measured in terms of action, thought,

affect, and fantasy. Clum and Clum suggested that persons can be self critical and still use turning against others as a defense. They predicted that depressive mood in undergraduate students would be related to use of the defense mechanism of turning away from others; aggressive fantasy and thought against others would be related to depressive mood, but aggressive action would not.

Neither hypothesis was supported for women. For men the first hypothesis was supported in five of the seven mood scales. The second hypothesis was supported for thought behavior in four of the seven scales. Intellectualization and reversal were also related to positive affect. Clum and Clum also reported that their hypotheses were supported for men but not women, while Wessman and Ricks (1966) found a similar relationship in women but not in men. Apparently, the gender of the person has powerful and imperfectly understood influences on mood and personality research.

In the Wessman and Ricks (1966) study, the men also filled out The 16 Personality Factor Test, once in an elated mood and once in a depressed mood. Men in depressed moods showed more desurgency, which Cattell has said is indicative of a simple type of depression.

In order to test Flügel's (1925) finding of lowered mood associated with intense (extreme) mood, Wessman and Ricks correlated the hedonic level and variability indices from the Elation vs. Depression scale (16). These indices were the mean (MA16) and standard deviation (SDA16) of

average values and the mean of high-minus-low values (MHL16). For women the correlation between MA16 and SDA16 was -.17 (n.s.), and for men, .03 (n.s.). The correlation between MA16 and MHL16 was .36 (n.s.) for women and .29 (n.s.) for men. These findings suggest relative independence of hedonic level and hedonic variability. The variability measures were significantly related for men (.56, $p < .05$) but not for women (.36, n.s.), which suggests that each measure assesses somewhat different aspects of variability.

In order to assess the relationships among scales, Wessman and Ricks factor analyzed male and female intercorrelation matrices. In both groups four factors were found, the first a general level of happiness factor upon which most of the "average" means loaded. The second factor for both males and females was a within-day variability factor with peaks and troughs loading on opposite ends of the bipolar factor. In factor analysis of the matrix of standard deviations, one large factor emerged for both groups: variability.

Each individual's mood ratings were intercorrelated and factor analyzed, with women routinely producing eight factors and men, six factors. The men's first factor was rotated through the Elation vs. Depression average score, and the remaining factors were rotated to orthogonal approximations of simple structure in order to see how many factors could be extracted which accounted for 10% or more of the common variance. For men the range of rotated factors which

met that criterion was from one (n = 4) to seven (n = 1). The women's analyses produced a range of one to four significant rotated factors, with most women having two or three. This smaller number is probably a result of women rating fewer scales. Wessman and Ricks have suggested that

> the number of factors produced by a person is a relatively precise indication of the extent to which the feelings that he records all vary together, as an all-or-none phenomenon, or move in a relatively differentiated and independent fashion. If the number of measuring scales is held constant, as it was here in each group, this number can therefore be considered an index of affective complexity. Such complexity might be considered to arise from conflict, since several of the secondary factors in any individual's factor plot are usually bipolar, indicating that when one set of feelings moves toward the positive side another set moves toward the negative. On the other hand, it might arise from a detached, analytical, isolating approach to moods, with clear awareness and fine differentiation of the characteristics of different feelings. If affective complexity arose from conflicts we would expect it to be greatest in the most unhappy people, while if it arose from distancing and isolation it might be found most developed in the most stable subjects. (Wessman & Ricks, 1966, p. 73)

Presuming that this index was a function of overall mood structure, Wessman and Ricks ranked male students with respect to the number of factors and correlated these ranks with the ranks of happiness (MA16) and stability (SDA16). The correlation with happiness was -.30 (n.s.), which was interpreted as a slight trend suggesting more complex men might be less happy. The correlation with stability was .57 ($p < .01$), suggesting that complex affective variation was associated with stability of mood. Since women pro-

duced fewer factors, they were ranked on proportion of variance accounted for by all but the first centroid factor. This measure of affective complexity correlated .23 (n.s.) with happiness and .26 (n.s.) with stability. While both correlations are nonsignificant and therefore uninterpretable, they suggest that the relationship between affective complexity and happiness for females is the opposite of that for males. That previous mood investigators have found men and women to be different makes it tempting to hypothesize disparate processes in the formation and operation of affective complexity. However, the rapport established over a 3-year period with men, the different number of mood scales used in the analyses, the small sample sizes, and the different indices of affective complexity are all plausible explanations which must be investigated before such a hypothesis may be seriously advanced.

In a report characterized by extensive documentation, Wessman and Ricks failed to relate their notions of complexity and differentiation to an extensive body of theory and research on these concepts. The integration of the concepts of mood level and variability with existing notions of complexity and differentiation would seem to be a fruitful task, and this integration will be attempted after a discussion of some additional research in mood and personality.

After studying Harvard men for nearly three years, Wessman and Ricks (1966) had correlated some 365 personality

variables with Elation vs. Depression scale standard deviations of high, average, and low ratings and with mean daily range in order to ascertain what aspects of personality were associated with variability and stability. These variables were also correlated with the mean of average ratings on the Elation vs. Depression scale in order to characterize students at various levels of happiness. Of the 365 correlations with average hedonic level, 81 (22.19%) were significant at the .05 level of significance, which greatly exceeds a chance expectation of 18 (5%). Of 1,460 correlations with variability measures, 77 (5.27%) were significant, which barely exceeds a chance level expectation of 73 (5%). Seven of the significant correlations were with other PFS variables.

These findings suggest that variables from interviews, questionnaires, the Rorschach Inkblot Test, Thematic Apperception Test, Cattell 16 P F Test, the Minnesota Multiphasic Personality Inventory (MMPI), and Q-sort items related to hedonic level, but that these variables do not tap many of the attributes represented by mood variability measures. For example, the MMPI Depression scale correlation with MA16 was -.83, while no significant correlation was reported between the D scale and the four variability measures. Apparently, most standardized tests measure aspects of hedonic level and aspects of temperament associated with hedonic level rather than aspects of variability. Closer inspection of the correlations with variability

measures reveals that 61 personality variables had significant correlations (n = 77) with one or more of the four variability scores. Of this group, 19 were Rorschach Inkblot Test variables, 9 were ratings made by psychologists (clinical rank order), 5 were Q-sort variables, and the majority of the remainder were variables from unpublished questionnaires. The nature of these variables makes it difficult to apply group characterizations that will describe each of the measures accurately. Some variables in the group were designed to allow maximum latitude in choice of responses, to give opportunities for a person to describe himself in unique patterns, and to measure aspects of personality style at the deepest levels of organization. These factors might be included in future instruments designed to assess personality characteristics related to mood variability.

It is beyond the scope of this review to present these results in great detail, but the main personality trends in happy and unhappy men and in stable and variable men will be summarized. Due to the paucity of information on the Radcliffe sample, most of these generalizations will be confined to the Harvard sample.

Happy men were characterized as more self-confident and successful in interpersonal relationships and work, and they enjoyed a sense of identity and meaning. Less happy men were seen as pessimistic and unsure of themselves in work and interpersonal relationships. Work was burdensome

and unsatisfying; interpersonal relationships were frequently sources of anxiety, guilt, and anger that resulted in withdrawal and isolation. In summary, unhappy men showed evidence of poor ego-integration and ego-identity.

Stable men evidenced a sense of identity, autonomy, self-sufficiency, and self-control which supported an overall characterization of maturity. A sense of stasis and stereotypy was evidenced by the belief that life would continue unchanged. Variable men were lively, energetic, creative, and tense, with conflicts and fantasies in abundance. Anxiety, narcissism, and exhibitionism were typical aspects of their lives, leading to intense involvement with self and others. Role diffusion and future orientation in variable men suggested that the process of becoming had not yet given way to the orderly, repetitive life style of stable men.

In a brief report, Warehime and Jones (1972) correlated scores from the Marlowe-Crowne Social-Desirability Scale and the Edwards Social-Desirability Scale with scores from one administration of the Personal Feeling Scales. All correlations involved one social-desirability scale correlated with PFS scores, with the effects of the other social-desirability scale partialed out. Edwards-PFS correlations resulted in nine significant coefficients for men and three for women. The Marlowe-Crowne correlations produced two significant correlations for men and eight for women. The obtained sex differences, the authors suggested, may be

attributable to item content of the three measures, and the significant correlations suggest that dissimulation may occur in the report of affective states.

Gorman, Wessman, and Ricks (1975) replied that while some correlations have been obtained between PFS variables and indices of social desirability, the PFS data were corroborated by extensive data from a variety of sources. Noting that correlation is not causation, they suggested experiments designed to explore these relationships. The previously cited research of Lamont (1972a, 1972b) has suggested that mood level may effect scores on internal-external locus of control measures, and the same may be true in this case. Perhaps the most plausible explanation is that mood is a result of complex interrelationships of personality characteristics and events in the world; social desirability measures may tap some of these aspects without entailing dissimulation.

Becker and Nichols (1964) investigated the relationship between cyclothymic personality blood factors and personality correlates of young manic-depressives. Hypothesizing a continuity between mild cyclothymia and manic-depressive psychosis, they predicted cyclothymics would have weaker achievement motivations and blood factors similar to manic-depressives, more need for affiliation, and higher scores on the California-F Scale and Traditional Family Ideology Scale. Becker and Nichols expressed a distrust of measures of cyclothymic tendency and selected several: the Wessman,

Ricks, and Tyl (1960) Elation vs. Depression scale, the MMPI D and Ma scales, a 5-item mood inventory scale to be administered to a woman and filled out by her peers, and the Hildreth Battery of Feeling and Attitude Scales. With the exception of the PFS Elation vs. Depression scale, none of the cyclothymic indices produced significant correlations with any other of the personality variables. Cyclothymic tendencies were associated with lower need for achievement, more need for affiliation, and higher strength of traditional family ideology. The findings support the continuity hypothesis as well as providing evidence that the Elation vs. Depression scale has construct validity.

Lewinsohn and Libet (1972) tested the behavioral theory postulate that depression is a function of a low rate of positive reinforcement for activities. Others believe that depression leads to reduced activity and lower rates of positive reinforcement. College students rated moods on the Depression Adjective Check List (Lubin, 1965) and checked the number of pleasant activities engaged in each day. Scores on both measures were correlated for each student for 30 days (0 displacement correlation). To test the possible causative relation between mood and pleasant activities, the mood scores were shifted one or two days backward (negative displacement) or forward (positive displacement) in relation to activity scores, and the correlations were recomputed for each student. If negative displacement correlations are higher than positive displacement corre-

lations, the findings support the view that lowered mood produces lower pleasant activity. If positive displacement correlations are higher than negative displacement correlations, the behavioral view is supported, i.e., that reduced pleasant activities produce lowered mood. Analysis of the correlations showed that zero displacement correlations were significantly higher than displacement correlations; positive and negative displacement correlations did not significantly differ from each other. More detailed analysis showed no significant relationships between mood and activity level for 10 students; mood was predicted from earlier activity scores more accurately than by zero displacement scores for 10 students; pleasant activity level was predicted by earlier mood scores more accurately than by zero displacement scores for 5 students. Lewinsohn and Libet interpreted their results as consistent with behavioral theory.

Lewinsohn and Libet (1972) developed a fruitful design which failed to provide expected results, perhaps due to the time frame adopted for their study. Mood is normally considered to be variable within days. Data presented in this review have supported that assumption. By using one day as the unit of analysis, these researchers probably obscured the normal within-day variation of mood. A time frame of a few hours might have improved the sensitivity of the experiment by isolating periods when one mood was experienced during the entire interval. In one day a person's mood

level may be expected to vary, and a single mood estimate, may be misleading. This problem is similar to the one encountered by Speisman et al. (1964) with mean skin conductance in a 17-minute time interval, The smaller unit analysis was much more sensitive in showing differences than was the mean level over time. Research on mood levels of three college students during a 24-hour period (Nowlis & Cohen, 1968) also supported this view.

Research using a variety of tests and assessment procedures has demonstrated that relationships between mood and personality exist. Mood level has been shown to relate to several personality assessment variables. Studies of variability, however, have not been very successful in finding correlates for this aspect of mood. The work of Becker and Nichols (1964) and Wessman and Ricks (1966) provides notable exceptions, but even their work has shortcomings. The Becker and Nichols research was restricted to a female sample because of difficulties in getting permission to draw blood samples. The range of correlations between cyclothymic indices and mood variability scores was between .00 and .41 (signs ignored), which suggests that other factors may yet be required to explain variability. Their focus on psychodynamic aspects of manic-depressives and cyclothymics ignored other possible personality characteristics that may explain how normal mood varies in normally functioning people.

Wessman and Ricks (1966) avoided this pathological

orientation by using a factor analytic measure of affective complexity to explain mood variability. High affective complexity did relate to stability of mood, but only in a male sample. Wessman and Ricks (1966) suggested that selection of men with extreme moods may have inflated some of the correlations with mood scores. This should be considered a possible limitation to the validity of the affective complexity measure derived from their mood data. The unusual sample they used also suggests caution in generalizing their results to other populations.

These criticisms of the Wessman and Ricks study do not negate its importance in identifying correlates of hedonic level and variability. However, it is preferable to develop independent measures of personality which correlate with mood and its fluctuation. If these measures are grounded in a theoretical framework that predicts these relationships, such measures will be preferable to empirically derived measures that lack extensive theoretical underpinnings. The next section of this review will describe an independent theoretical framework to explain mood and its variation.

Cognitive and Affective Complexity

Complexity and mood variation. The Psychology of Personal Constructs (Kelly, 1955) attempts to explain how we understand our world. Kelly believes we order our experiences by interpreting them through the use of bipolar personal constructs. The Wessman-Ricks mood scales provide many examples of bipolar constructs: energy vs. fatigue,

elation vs. depression, harmony vs. anger, and others. More common constructs include good vs. bad, kind vs. cruel, and others commonly used to characterize personal characteristics and interpersonal relationships. The verbal labels we assign to poles are approximations of the actual construct rather than the construct itself.

Kelly believes that as we construe the world, we lay a template (construct) over it to try to make sense of it. Constructs that help us understand and predict events and experiences are added to our repertory of constructs and subsumed by superordinate constructs. Thus, events in the world are differentiated by the use of constructs which are integrated into a hierarchical repertory of constructs.

Kelly (1955) introduced the Role Construct Repertory Test (Reptest) as a method to elicit personal constructs. A sample of persons in significant roles in the subject's life are selected, and the subject is asked to sort these persons into groups using his constructs. The construct is elicited by presenting him with a sample of three persons and asking how two of them are alike and different from the third. The way these persons are alike is called the emergent pole of the construct. The other pole is generated by asking (a) what the opposite of the construct is (opposite method) or by asking (b) how the third person is different from the other two (difference method). Epting, Suchman, and Nickeson (1971) have shown that the opposite method produces more bipolar constructs than the difference

method and is therefore more consistent with Kelly's notion of constructs. Following the elicitation procedure, the subject indicates whether the emergent pole of the construct applies to other important persons he has selected. In the grid form of the Reptest, a check mark is placed in columns under the role figures to whom the construct applies. After repeating the elicitation and checking procedures, a grid is obtained (filled with checks or voids) which has the dimensions of number of persons (columns) by number of constructs elicited (rows).

Kelly (1955) developed a mathematical procedure to see how closely the check patterns of constructs resembled each other. In this "nonparametric factor analysis" procedure, a most typical row is compared to each of the rows in the grid, and a first factor is extracted containing rows which are highly similar to the comparison row. Taking into account the concept of negative loadings, Kelly reflected rows by replacing each check with a void, and vice versa, so that identical constructs (bad vs. good, good vs. bad) will load on the same factor.

A grid shows high differentiation when few constructs load on the first factor, which is analogous to the notion of proportion of variance accounted for by all but the first factor. A grid also shows high differentiation when many factors are produced. Using this procedure avoids some problems of language usage, since construct labels are used to characterize the factor but check patterns are used to to form it.

Epting, Wilkins, and Margulis (1972) have shown that persons who are high differentiators, based on the structure of their check patterns, produce constructs which are judged to be more abstract in content than constructs produced by persons who are classified as low differentiators on the basis of structure. However, these two methods of assessing performance were not proposed as identical. A ceiling effect may have occurred with abstraction level since some students showed great difficulty in producing constructs abstract enough to sort the complex stimuli used in the study (social issues). This difficulty may also appear in feeling constructs, since the English language has relatively few emotion words compared to the number of words available for other classes of events.

Bieri (1955) has suggested that the amount of differentiation in a person's construct system is an index of cognitive complexity-simplicity (CC), with higher levels of differentiation being identified as high complexity. High CC may represent differential perceptions of the (interpersonal) environment which aid the person in predicting the behavior of others.

Wessman and Ricks (1966) described affectively complex men as hedonically stable, which suggests that such men may be better able to understand or predict their emotional experiences because of higher differentiation available in their constructs dealing with feelings. The affectively complex person has a number of constructs available to

interpret emotional experiences occurring in different aspects of life. He may feel dissatisfied with academic progress, yet still gain satisfaction from interpersonal relationships. In the extreme case, the affectively simple person has one basic construct--happiness vs. unhappiness, with several other constructs being almost identical although they may be labeled differently. For this person one area of dissatisfaction (work) will bring dissatisfaction in all areas of life. The young adolescent whose romance is on the rocks provides a stereotype of the affectively simple person whose unhappiness in one aspect of life contaminates all other aspects.

A further examination of data provided by Wessman and Ricks (1966) suggests that parallels exist between Personal Construct Theory conceptions of complexity and affective complexity derived from factor analyses of the mood data. A factor's importance or explanatory power is usually expressed as the amount of variance accounted for by that factor divided by the amount of variance accounted for by all the factors extracted. This index is called percentage of total communality.

Wessman and Ricks have presented the factor structures of Shield, the most stable man, and Swallow, the most variable man. Swallow's matrix of means on the PFS produced eight factors while Shield's produced six. Swallow, the most variable man, produced factors with the following communalities: 51, 10, 9, 9, 7, 6, 4, and 3%. Over half of

Swallow's communality is in his first factor, which is analogous to many constructs loading on the first factor in Kelly's nonparametric factor analysis. Wessman and Ricks reported that on one occasion Swallow was down in all PFS ratings and even thought everyone else was depressed.

Looking at the same data for Shield, the steady man, we find the following: 24, 20, 17, 14, 13, and 11%. Note that all six of these facotrs are larger than Swallow's second factor which accounted for about 10%. Shield has many factors and a large percentage of variance accounted for by all but the first factor suggesting more differentiation and complexity in the stable man. Mathematically, scores can go down on factor-one variables without bringing down scores on variables which load high on other factors. Wessman and Ricks report that Shield's mean daily range on the Elation vs. Depression scale was 1.25--very little change within a day. He was described as very controlled, inhibited in the expression of emotions, and seclusive. Shield apparently has a number of different constructs with which he understands, predicts, and controls his emotional life.

The data in the case studies of Swallow and Shield suggested that Personal Construct Theory and its methodology may make a contribution to the understanding of affective complexity and mood variation. A review of the literature in 1970 revealed that the concepts of complexity and mood variation had not been linked together in any ex-

perimental investigation, with the exception of Wessman and Ricks. The cognitive complexity literature was reviewed to find guidelines for constructing and scoring a measure of affective complexity.

Measuring complexity. Bonarius (1965) listed 10 different measures of cognitive complexity (CC), and more have been developed since that review was published. Bieri, Atkins, Briar, Leaman, Miller, and Tripodi (1966) described a Reptest modification which is suitable for group administration and has the advantage of small size (10 x 10). Constructs are provided in the form of 10 bipolar rating scales. Ratings range from -3 to +3 with no zero point. Each rating is compared with all the ratings below it. Each exact agreement counts as one match. This process is repeated for all 10 columns. The total number of matches is the index of cognitive complexity. In a later refinement of the factor analytic technique, Kelly (1962) developed a technique to measure proportion of variance accounted for by all but the first factor. Bieri et al. (1966) reported a correlation of .90 between their measure and the measure proposed by Kelly (1962). Using provided constructs has the advantage of reducing administration time. Bieri et al. reported a correlation of .50 between CC scores derived from grids where constructs have been provided by Bieri and grids where constructs are elicited using the sorting procedure. Bieri et al. (1966) showed this grid to be useful in several investigations of cognitive complexity.

Adams-Webber (1969) proposed average number of matches between rows (AMR) as a CC measure. The rows in the grid are compared to each other as binary digits. He reported a correlation of .90 with the Bieri et al. (1966) measure. J. V. Kelly (1964, in Bonarius, 1965) derived a mathematical index of simplicity which he named a Test for Random Information (TRI). Adams-Webber (1969) reported a correlation of .94 between TRI and AMR. Both measures rely on the assumption that random-looking patterns of checks and voids are indices of high differentiation.

Adams-Webber (1970) compared a number of indices derived from a Reptest using indices derived from J. V. Kelly's program. These indices included: explanatory power of the first factor for rows and for columns, the TRI, and the AMR score. These were all correlated with an identification score. This score is the number of columns that are significantly related to the self column, in which the person evaluates himself on the constructs. Significant correlations were observed between the four complexity measures and the identification score; range of correlations was .72 to .79.

The review of mood research has demonstrated that men and women produce different results in psychological experiments. This effect can also be found in the complexity-simplicity literature. Higgins (1959, in Bonarius, 1965) operationally defined cognitive complexity (CC) as the number of different verbal constructs generated and found

females as more complex than males. Supnick (1964, in Crockett, 1965) also reported females using more constructs than men in her study. Thus there is some evidence to support the thesis that women are more cognitively complex than men.

Other research has suggested that not only are mean levels of CC different between the sexes but that relationships between CC and other task performances differ between the sexes. Bieri, Blackburn, and Galinsky (1958) found a significant correlation between preference for complex drawings and field independence for men but not for women. Irwin, Tripodi, and Bieri (1967) found that males were more differentiated when construing positively evaluated figures while females were more differentiated with neutral or negatively evaluated figures.

A number of interpretations of these studies are plausible. Men and women often differ on levels of complexity, but to suggest that one sex is innately more complex than the other is perhaps an oversimplification of the findings. However, it does seem reasonable to hypothesize differences in complexity between the sexes, but the determining factor seems to lie in the class of objects to be differentiated.

The data also show that CC scores relate to other task performances, but often this finding holds true only for one sex, perhaps reflecting the nature and type of events that other tasks measure such that one sex has an experiential advantage over the other in a given task. This

finding may also reflect a sex preference for using the complexity-simplicity dimension for a given realm of events. Thus, males may find that making fine differentiations makes sense or is useful for a particular class of events, while women may find this dimension totally irrelevant and prefer an entirely different strategy such as generalization. While these statements are highly conjectural, they are consonant with, although not directly supported by, the data. For whatever reason, men and women do differ in CC, and researchers who use this variable will be wise to analyze data for men and women separately, since pooling scores may neutralize (statistically) two divergent trends in the data.

Tripodi and Bieri (1963) found a correlation of .50 between the use of elicited and provided constructs in calculating CC. Thus the two versions are probably not equivalent forms of a test measureing CC. In developing a new complexity measure, the elicited construct procedure seems preferable since it is well established in the literature and closely reflects Kelly's (1955) view that constructs are unique and personal.

McPherson, Borden, Hay, Johnstone, and Kushner (1970) have related Personal Construct Theory and emotional behavior in an experimental setting. Citing unpublished research by Dixon (1968), they noted that schizophrenic patients who had been described as flattened in affect failed to use constructs dealing with personality character-

istics or current emotional states when asked to state the main difference between two people in pairs of photographs. McPherson et al. studied nine male and nine female schizophrenic patients who had been rated by psychiatrists as having flattened affect. The reliability of those ratings was .44, which accounts for 19.4% of the variance. Each patient was presented with five pairs of photographs with the instructions to state the main differences between the two people. Raters classified responses into categories based on content of the responses. The categories reflected differences in age, nationality, occupations, activities, stance, physique, personality or emotional state, background of the photo, and technical quality of the photo. Two other categories were used for denial of differences and irrelevant differences based on the patient's delusional system. Kendall Tau coefficients were computed on ranks of affect-flattening ratings and ranks of percentage of use of the category. Of the 12 coefficients computed, only one reached the level required for statistical significance. Support was found for Dixon's finding that severe affective flattening is associated with infrequent use of personality and emotional state explanations of differences between people in photographs ($\underline{t} = -.47$, $\underline{p} < .01$). A nonsignificant trend suggested that high affective flattening is associated with more frequent descriptions of the background of photographs.

This study suggests that Personal Construct Theory has

some contributions to make to the understanding of emotional states. However, a number of features in this study seem to obscure the relationships between constructs and emotional states. The use of ratings of emotional state by outside raters at one point in time overlooks variability of levels of emotions. The reliability coefficient of the ratings is so low that it is questionable that raters were rating the same dimension. Platman, Plutchik, and Weinstein (1971) compared daily self-ratings of patients in an inpatient psychiatric ward with ratings of depression by nurses and psychiatrists. Nurse and psychiatrist ratings were related to each other (r = .54), nurses' ratings were not related to patient self-ratings (r = .27), and psychiatrists' ratings were not related to patients' self-ratings (r = -.04). Thus the study by McPherson et al. has questionable relevance to self-rated emotion.

McPherson et al. (1970) relied on content indices of personal constructs and ignored the structural properties of differentiation and relationships among constructs. The position taken in this review is that content categories are constructs of categorizers placed upon the constructs of others. To the extent that we understand and share construct systems, this procedure may be valid. Advocates of content analysis may also reasonably argue that differentiation, integration, and factors are constructs that structure analysts apply to check marks placed by others in little boxes.

The procedure used by McPherson et al. (1970) to elicit constructs allowed a wide variety of constructs to be used. Most of the categories had little to do with feeling states, but the one category that did include feeling descriptions was related to affective flattening. This finding supports the belief that constructs have limited ranges of application. Perhaps more could be learned about emotional states by asking people to concentrate on feeling constructs rather than on more general types of constructs. In order to test this belief, a study was designed.

Rationale of the Study and Hypotheses

The parallels between the work of Wessman and Ricks (1966) and the theory and research concerning personal constructs and cognitive complexity have suggested that differentiation in the framework of Personal Construct Theory is related to differentiation in mood variation. Wessman and Ricks (1966) found no relationship between affective complexity (AC) and mood level, but it seemed that persons who could understand and control emotional experiences might be happier than those who could not. However, mood variability became the main focus of the present study.

Research reported by Vannoy (1965) suggested that a measure of AC would have to be designed to tap a very narrow range of constructs that had special relevance to feeling states. Vannoy factor analyzed scores on 20 measures which purported to measure CC, and extracted eight factors which

led him to question whether CC was a general characteristic. (This issue will be revisited when the results of this investigation have been presented.) People may be complex in the cognitive domain but not in the affective domain (or vice versa), so the decision was made to assess both types of complexity independently.

The strategy adopted to measure AC was to focus on feeling states in relation to significant people in most people's lives. People were chosen as objects to be construed in the belief that most feelings occur in relation to people, although some events (sunrise, moonrise, rain, etc.) may also be construed along emotional dimensions.

Wessman and Ricks (1966) found that most significant correlations with mood variability (SDA16) involved variables from relatively unstructured assessment devices. In an initial investigation of AC, subjects will be allowed maximum freedom of response. Kelly's (1955) Group Form Conceptual Grid was selected as a model. Nineteen role figures seemed to be an adequate sample of significant people, and 22 construct sorts were considered enough to get a large sample of feeling constructs.

The choice of a method for scoring affective complexity was the crucial decision of the study. However, the work of Adams-Webber (1969, 1970) suggested that average matches between rows and total number of matches (Bieri et al, 1966) both measured differentiation in a way that related to the factor analytic measures of differentiation proposed by

Kelly (1955) and Wessman and Ricks (1966). The Bieri measure was chosen since it could be applied to the AC measure and to Bieri's CC measure.

Kelly's (1955) reflection procedure is a mathematical way of approximating the way a person organizes his construct system. Scott's (1969) model of cognition advanced the view that one way we integrate our cognitions is along a reference axis described as the affective attribute. Objects are grouped according to affective relevance (affective balance) and evaluated according to one's affective reaction to these objects (affective-evaluative consistency). The work of Osgood, Suci, and Tannenbaum (1957) supported the view that desirability (evaluation factor) is an important way we organize our cognitive systems. The Bieri CC measure seems to be dimensionalized, with desirable poles of constructs grouped together. Desirability appears to be a relevant way to dimensionalize the affective grid.

Several hypotheses emerged in the process of integrating the Wessman and Ricks data into Kelly's theoretical framework. People with well differentiated feeling construct systems will be able to understand and control their emotional lives, and experience lower mood variability. The affectively undifferentiated (low complex) person will have less understanding and control and will experience feelings (in the extreme case) as chaotic forces over which he has little control.

To the extent that complexity is a general trait, style,

or process, cognitive complexity will be expected to relate to mood variability. Since affective complexity narrows the focus to feeling constructs, the relationships it has with mood variability will be stronger than relationships between CC and mood variability.

Wessman and Ricks related their measure of affective complexity with one mood variability index: the standard deviation of the average ratings on the Elation vs. Depression scale. This seemed to be a narrow conception of mood variability, so mood variability estimates will be computed for each of the 16 Personal Feeling Scales (PFS) so that evidence will be available to assess the relationships of affective complexity with a wide variety of moods.

Mood level is of secondary interest. In order to compare the findings of this study with those of Wessman and Ricks, complexity scores will be correlated with mood level measures derived from each of the 16 Personal Feeling Scales. The control afforded by high complexity levels might result in higher mean mood level and smaller daily ranges, but the Wessman and Ricks findings suggested no relationship between complexity and mood level. No direction will be hypothesized for the correlation coefficients, but it seemed that some relationship may exist between the variables.

Hypotheses

The general hypothesis of this study is that high levels of affective complexity (ACR) and cognitive complex-

ity (CC) will be associated with low mood variability (and with each other), with affective complexity being the more powerful of the two variables. Since high complexity is defined as a low number of matches numerically (low complexity scores), correlations between complexity measures and mood variability measures are predicted to be positive. Additionally, ACR and CC are predicted to relate to mood mean scores, with AC being the more powerful of the two complexity variables.

A number of operational hypotheses were generated to provide some evidence to support or reject the theoretical positions previously stated. All hypotheses will be tested for males and females separetely at the .05 level of significance. Hypotheses 1, 2, 3, 5, and 6 will also be tested for the total sample to assess the effects of pooling the male and female samples.

Hypothesis 1: Affective Complexity Reflected (ACR) and Cognitive Complexity (CC) will be positively related.

Hypothesis 2: ACR scores will be positively related to each of the 64 mood variability scores.

Hypothesis 3: CC scores will be positively related to each of the 64 mood variability scores.

Hypothesis 4: ACR score correlations with the 64 mood variability scores will be higher than CC correlations with the same 64 scores.

Hypothesis 5: ACR scores will be related to each of the 64 mood mean scores.

Hypothesis 6: CC scores will be related to each of the 64 mood mean scores.

Hypothesis 7: ACR score correlations with the 64 mood mean scores will be higher than CC score correlations with the same 64 scores.

Hypothesis 8: The ACR correlation with the mean high-minus-low scores on Scale XVI: Elation vs. Depression will be higher than the CC score correlation with the same scores.

Hypothesis 9: The ACR correlation with the standard deviations of the average scores on Scale XVI: Elation vs. Depression will be higher than the CC score correlation with the same scores.

Hypotheses 1, 5, and 6 will be tested with two-tailed tests of significance. The remaining hypotheses will be tested with one-tailed tests.

METHOD

Subjects and General Procedures

The original sample included 74 male and 50 female undergraduates who were enrolled in three undergraduate psychology classes at the University of Florida. Students in general psychology were required to participate in experiments in order to gain familiarity with psychological research. Students in social psychology were awarded extra points on final exams. Students taking the personality course responded to a request by the experimenter for their services although no grade incentives were forthcoming. Personal appeals were made to all three classes, emphasizing the importance of moods and feelings to everyday life and the paucity of research on normal feelings.

These incentives were sufficient to secure student participation in the first portion of the experiment. Students completed the affective complexity and cognitive complexity measures (described below) in one experimental session and were recruited for the second portion of the study, which required them to rate their moods daily for 21 days. Students who failed to complete both portions of the tasks were eliminated from the study, leaving a final sample of 46 males and 29 females. The mean age for men was 21.83

years (S.D. = 2.67); for women, it was 22.34 years (S.D. = 6.36). In the final sample, 31 males and 14 females were enrolled in general psychology, 10 males and 8 females were enrolled in social psychology, and 5 males and 7 females were enrolled in personality.

Students took the affective and cognitive complexity measures during eight scheduled 2-hour periods over a 7-day period. The groups ranged in size from 9 to 21 ($\bar{X}$ = 14.8) and resulted in a sample of 74 males and 45 females. To achieve a sample of 50 females, the experimenter administered the tasks to three females individually and two females together, since these students discovered the experiment too late to sign up for any of the eight scheduled test sessions. A minimum of 50 students of each sex was required, since high attrition rates were expected for the mood rating portion of the study.

Testing Materials

Each student received a packet of testing materials on arriving for the testing session. A cover sheet briefly introduced the tasks and provided guidelines to help the students budget their time (see Appendix A).

The first task was the Affective Complexity Reptest (Affective Grid). The Affective Complexity Reptest is a modification of the 19x22 Conceptual Grid described by Kelly (1955). Twenty-two triads of a sample of 19 significant persons were presented to the student with the instruction to decide how two of these people are alike and different

from a third "in the way they make you feel." The word or words used to describe those feelings were called the construct, and the words used to describe the opposite feeling were called the contrast. The students then placed checks in columns corresponding to persons who also made the student feel like the construct. This process was carried out 22 times (see Appendix B for full instructions). After completing the grids, students were asked to look at their constructs and place a check in the column (construct or contrast) to indicate which pole seemed most desirable for each of the 22 construct-contrasts (see Appendix C).

The experimenter pretested the Affective Grid by taking it himself as well as by administering it to several graduate students and undergraduate majors of his acquaintance. Their verbal reports and the resulting grids indicated that they understood the task, although most reported that the task was very demanding. The most frequent comment was that these pilot subjects had seldom been called upon to analyze their feelings in such detail in relation to so many people.

The experimenter answered any questions that came up on an individual basis and inspected the first two or three construct-contrast pairs to insure that students understood the task. In the first group many students seemed to misunderstand the task in that they generated nonfeeling constructs: they are handsome vs. ugly, brown hair vs. not brown hair, etc. The experimenter then augmented the written

instructions to the students by a brief discussion of feelings and suggested they test each construct by asking themselves the question "Have I ever felt (construct) before?" The example "happy vs. sad" was offered as one possible construct-contrast pair, with the suggestion that many other dimensions were possible. In subsequent groups the students read the instructions, filled out the role list (overlay sheet), and then waited until the experimenter discussed the issues raised above before proceeding to fill out the Affective Grid. The experimenter then checked the progress of each student and questioned him about constructs which appeared to be nonfeeling in nature. "Intelligent vs. stupid" was sometimes used to describe the way a student felt about himself when in the company of people on the role list, but more frequently was used to describe the people themselves. This latter use was often accompanied by the comment "That is the way I feel about them." In these cases the distinction was made between feeling as a state usually accompanied by bodily sensations, etc., as opposed to feeling used as vernacular for think, evaluate, have an opinion about, etc. This distinction usually helped the student to understand the task well enough to complete it.

Situations Grid

A Situations Grid (Kelly, 1955) was administered between the Affective and Cognitive Grids. The student's task was to indicate which persons on the Affective Grid role

title list he could depend on in 11 different situations (see Appendix D). This grid was used to separate the administration of the affective and cognitive grids (by 15 or 20 minutes) as well as to provide some exploratory data for future research. An intervening task between the affective and cognitive grids was considered to be an efficient way to minimize direct carryover from one task to the other, although, to the extent that complexity may be a general personality characteristic, a certain amount of relationship could be expected between the measures.

Cognitive Grid

Bieri (1966) reported that his modified group form Reptest correlated well with the standard Kelly Reptest but had the advantage of small size (10 by 10) and provided constructs so that administration time was greatly reduced. This consideration was important since the Affective Grid usually took 60 to 75 minutes to complete. The Bieri Grid was used to measure cognitive complexity, so that the relationship between cognitive complexity and affective complexity could be ascertained (see Appendix E for full instructions).

The students were reminded to use the numbers in parentheses on the Bieri Grid role title list to refer back to the Affective Grid role title list to find the names they needed to rate on the 10 constructs provided by Bieri. The students reported little difficulty on this task and frequently finished in 10 or 15 minutes. The experimenter inspected these grids to insure that no zeros had been used.

The order of presentation of the three tasks was not counterbalanced in order to minimize any effects the Situations Grid or Cognitive Grid might have on Affective Grid performance. Since affective complexity was the main variable of interest, the effects of other test performances were eliminated by administering the Affective Grid first.

Mood Scales

When students completed their grids, they were asked to read a cover sheet which invited them to participate in the mood rating portion of the study, stated the amount of credit to be earned, and explained the use of the scales (Appendix G). Attached to the cover sheet were a copy of the Wessman and Ricks (1966) Personal Feeling Scales (Appendix H) and 35 copies of the Wessman and Ricks Daily Record of Personal Feelings (Appendix I). Confidential responses were assured by stamping identifying numbers on the daily record sheets. Students who declined to participate in this phase of the study were encouraged to reconsider and at least try it for a few days. The students who still declined were asked if they would come back in 3 weeks for another experiment (the test-retest reliability study for the affective and cognitive complexity measures). The remaining students were recruited for the reliability study from students remaining in the second (mood) phase of the study.

Students turned in mood data daily, except for weekend ratings which were turned in on Mondays. This procedure

was used to discourage students from filling out the scales for more than 1 day at a time and to give the experimenter the opportunity to check for missing data, unreadable data, and impossible ratings while students could still remember the ratings. The experimenter recorded the data each day at 5 p.m. and telephoned students who had not turned in data for the day or had missing data.

A list of student numbers was posted by the collection box for students who had not turned in data or had incomplete data, to give them the opportunity to see the experimenter and rectify any difficulties in their ratings. Students who were not contacted by phone or list lost credit for each day of data that was not corrected or turned in by 5 p.m. the next day. These data were eliminated from the analysis. Thus, while all students had 21 days of mood ratings, the calendar dates were different among students. Additionally, students started ratings on different days according to which of eight groups they were in when the first group of tests was taken. Due to these factors, each student's 21 days of data fell in a time interval of 6 weeks in the summer term, 1970. The interval ended 2 weeks before final exams. Some students provided as many as 35 days of data, thereby creating a rich record of one life during a brief span of time. Only the first 21 days of data were included in the data analyses.

Students were informed that they had to complete and turn in on time, a minimum of 21 days of mood ratings to

get credit for that portion of the experiment. A total of 75 students (46 males and 29 females) met this minimum requirement: 62.16% of the original male sample of 74 and 58.00% of the original 50 females.

Data Scoring Procedures

Affective complexity (AC) can be scored in a number of ways originally designed for measuring cognitive complexity (CC). The method chosen for the AC Grid was the total number of matches as described by Bieri (1966). The Affective Grid can be looked at as 19 grids which are one column wide. To score the grid, one determines what is in the topmost grid square (a check or void) and counts the number of matches in squares (rows) below it. If a check appears in the top square and four more checks appear in the remaining 21 squares, the number of matches with the first row is four. The second row is similarly compared with each row (square) beneath it until each square in the column has been counted. This procedure is repeated for each of the 19 columns, and the matches for all columns are totaled.

Kelly has shown through his "nonparametric factor analysis" that some students define constructs in such a way that some constructs produced in the grid procedure are the exact opposite of each other (good-bad as compared to bad-good) so that identical constructs are represented by exactly noncongruent rows of checks and voids. If a grid containing these two constructs were analyzed, it would

yield a misleadingly low number of matches between the two rows. Since high complexity is defined as a low number of matches, an individual producing such a grid would be mistakenly attributed with a higher complexity level than he or she actually possessed. Kelly's nonparametric factor analysis takes this kind of data into account by reflecting rows, i.e., by replacing each check with a void, and vice versa, in order to maximize the number of matches between the first row and each comparison row.

Since the grids were not factor analyzed, the rows to be reflected were selected by students. After the grid was completed, students were asked to check the end of the construct which described the most desirable feeling. Most of these checks fell in the construct column, but when the check appeared in the contrast column, the row was reflected as described above and complexity was then computed. This method of selection was used on the grounds that desirable feelings should constitute the majority of constructs a person uses and that desirability is a way that dimensionalizes a person's affective life. Osgood, Suci, and Tannenbaum (1957) have demonstrated in work with the semantic differential that the evaluative factor occupies the most space in personal systems. Inspection of the reflected rows before reflection support this contention. Rows that were reflected usually had 4 or 5 checks out of a possible 19, which suggests that desirable poles of affective constructs are used by students to construe more people in their

environment. Thus desirability seemed to be a psychologically meaningful way to dimensionalize the Affective Grid. The total number of matches in the grid after rows had been reflected was called the Affective Complexity Reflected (ACR). The minimum number of matches is 2,090, and the maximum is 4,389. It was hypothesized (informally) that affective complexity reflected (ACR) would be a more psychologically meaningful measure of AC than the unreflected grid scores and should therefore correlate more highly with mood variability scores. ACR was therefore chosen as the measure of affective complexity for use in hypothesis testing.

Cognitive complexity was computed using the total number of matches as described by Bieri (1966). Squares in the Bieri grid can contain positive or negative values of one, two, or three. The range of scores must fall between 40 and 450. Inspection of the provided constructs reveals that the most desirable poles are grouped on the left side of the construct pairs. No reflection was required for this grid.

Each student's scores on the complexity measures were placed on IBM cards as were his first 21 days of mood ratings. Mood ratings for days exceeding Day 21 were not used in the analysis in order to provide a constant number of observations (n = 21 days) for each student. Sixteen new variables were then computed for each day of mood data for each student, using a program written by Mr. James

Hollan of the Department of Psychology, University of Florida. The 16 variables were the result of subtracting each low value from its corresponding high value for each of the 16 mood scales. Thus, each student had 16 high values (H), 16 average values (A), 16 low values (L), and 16 high-minus-low values (H-L) for each of 21 days of mood rating.

The initial analysis was performed to produce descriptive statistics. Each student was analyzed individually for 64 mood variables. The BMD 02D program of the UCLA Biomedical Program Library package (Dixon, 1968) was selected for this purpose and run on the IBM 360/50 computer at the University of Florida Computing Center. The output from the BMD 02D includes a number of descriptive statistics, but the standard deviations were considered the most important variables in this study, since our focus is mood variability rather than absolute levels of moods. The 64 standard deviations were then placed on IBM cards for further analysis. These 64 variables will be referred to as mood variability scores.

In the rationale for this study it was stated that confining oneself to looking at the mean and standard deviation of average ratings on the Elation vs. Depression scale seemed to miss the richness of mood level and variation. Therefore the means and standard deviations of the 16 high, average, low, and high-minus-low values were also placed on cards for further analysis. The 64 means will

be referred to as mood mean scores to differentiate them from the 64 mood variability scores. In addition, medians and ranges for the Elation vs. Depression scale were also computed to allow comparison of students in this study with those of Wessman and Ricks.

Reliability of the Instruments

It was essential to estimate the reliability of the affective complexity measure, since it represented a significant modification of the original Kelly Reptest. All three instruments were administered 3 weeks later to 19 males and 20 females ($n = 39$). Pearson product-moment correlations were computed between scores obtained from the two administrations of the grids. The reliability coefficients for the variables were: ACR, $r = .52$; CC, $r = .82$. Both correlations were significant beyond the .05 level. The reliability coefficient of .82 for CC appears to be one of the highest reported reliability coefficients for the Bieri Grid. Kelly (1955) has postulated that construct systems change as new events are experienced, which suggests that changes should be reflected in grids from one administration to another. Thus, reliability coefficients of grid techniques tend to be lower than those associated with other procedures. However, the ACR coefficient cannot be considered as totally adequate for a refined measuring instrument. This coefficient was considered adequate for an initial investigation of a newly postulated variable, although future investigations of

affective complexity might well begin with the development of more reliable measures.

No systematic reliability study was conducted with the Wessman and Ricks Personal Feeling Scales (PFS), since the experimenter was only interested in the events of one day. Moods were expected to change from day to day, so a stability measure (r) was considered an inappropriate index for the PFS. One student inadvertently provided a 1-day reliability estimate. He forgot to bring the Daily Record of Personal Feelings he had filled out the night before, so he filled out another at the experimenter's office the following morning. A few minutes later he found the record he thought he had forgotten. The product moment correlation between the two sets of 48 mood ratings was .69. This correlation coefficient should be considered as anecdotal evidence, since no attempt has been made to equate the set and setting of the two situations.

Data Analysis

In order to test the hypotheses concerning the relationships between complexity scores and mood scores, each of the complexity variables was correlated with each of the 128 mood variables. Initially, correlations were computed for the entire group of 75 students, but since both the mood and complexity literature have revealed sex differences, the correlations were also computed for males only ($n = 46$) and females only ($n = 29$). The nonparametric correlation program of the Statistical Package for the

Social Sciences (Nie, Bent, & Hull, 1970) was used to calculate the three sets of Spearman rank-order correlation coefficients that were used in the tests of Hypotheses 2 through 9. Nonparametric correlation coefficients were used with Hypotheses 2, 3, 4, and 9, which used standard deviations as mood variability scores. These coefficients were chosen because a distribution of standard deviations is significantly different from the normal distribution required by parametric correlation techniques. Nonparametric coefficients were also used in Hypotheses 5, 6, 7, and 8, which used mean values as mood scores. This decision was made because the Personal Feeling Scales have only the appearance of being interval scales, with no data to support the contention that the difference between two adjacent scale points is equal to the difference between any other two adjacent scale points. Inspection of any of the 16 scales suggests that the intervals are not equal. In the absence of data to support the equal interval hypothesis, nonparametric correlation coefficients were chosen for these hypotheses. Exact significance levels were provided by the computer program for each correlation coefficient. Tests were one-tailed as required for directional hypotheses (2 & 3) and two-tailed where the sign of the correlation was not predicted (Hypotheses 5 & 6).

The relationship between ACR and CC (Hypothesis 1) was assessed using the Pearson product-moment correlation coefficient and a one-tailed t test (Guilford, 1965).

Hypotheses 4 and 7 predict that ACR correlations will significantly exceed CC correlations with mood scores. The significance test used to test these hypotheses was the Sign Test (Siegal, 1956). The Sign Test is appropriate for data when pairs of scores can be ranked with respect to each other and each pair of scores is independent from others. High-minus-low scores are derived from high and low values and are dependent on them. The high, average, and low ratings were made independently and therefore were tested as a group of 48 paired observations. In addition, each group of 16 high, average, low, and high-minus-low scores was tested independently to better assess any differences in the magnitude of ACR and CC correlations in the subgroups of variables. Since the signs of the correlations had been predicted for the correlations among ACR, CC, and the mood variability scores, the sign of the correlation was taken into account in determining which correlation was the largest in each pair. All positive correlations were larger than all negative correlations in the test of Hypothesis 4. The signs were not predicted for the correlations among ACR, CC, and the means. For Hypothesis 7, differences between pairs of correlations were computed using the absolute values of the correlations without regard to sign. Since ACR correlations were predicted to be larger than CC correlations in Hypotheses 4 and 7, one-tailed tests were used.

Hypothesis 8 predicts the ACR correlation with the

mean high-minus-low scores on the Elation vs. Depression scale will exceed the CC® correlation with the same scores. Hypothesis 9 predicts that the ACR correlation with the standard deviation of the average scores on the Elation vs. Depression scale will exceed the CC score correlation with the same scores. Kendall (1970) has described a weak, approximate test for the hypothesis that one rho coefficient exceeds another. This test was used for Hypotheses 8 and 9. The test is not powerful due to the fact that the sampling distribution of rho is not known. Since the variance cannot be accurately estimated, a formula must be used that always overestimates the magnitude of the variance and thereby overestimates the standard error. The maximum variance of rho is three divided by the number of pairs of observations in the coefficient, the result multiplied by the quantity of one minus rho squared. In the test, the variances of the two correlations are added, and the square root is extracted. This quantity is the pooled maximum standard error (SE). This quantity is multiplied by a z value associated with the amount of area under the normal curve desired for the appropriate alpha level. For these data, a z of 1.64 is associated with an alpha level of .05 for a one-tailed test. The resulting quantity will be called ZSE for simplicity of presentation. The last calculation is to subtract one rho from the other; this difference will be called D. If D exceeds ZSE, one can conclude that one coefficient is larger than the other. Kendall (1970) has

observed that the large standard error of rank correlation methods is a disappointing feature of their use.

RESULTS

Before the results of the tests of hypotheses are presented, a brief presentation of student performances on the variables used in the study is in order. The mean ACR score for men was 2736.46 (*SD* = 323.35); for women, 2739.59 (*SD* = 330.78). The mean CC score for men was 143.87 (*SD* = 31.94); for women, 142.76 (*SD* = 37.23).

Wessman and Ricks (1966) provided some descriptive data for student performance on the *Personal Feeling Scales*. The median value of "average" ratings on the Elation vs. Depression scale was 6.00 for men, with all values falling between 5.05 and 6.68. In this investigation the males' median value was 5.83, with all scores falling between 4.76 and 8.33. For Wessman and Ricks females, the median "average" rating was 6.14, with scores falling in the range from 5.43 to 7.37. Females in this study had a median of 5.78, with all values occurring between 4.71 and 7.81.

The observed correlation between Affective Complexity Reflected (ACR) and Cognitive Complexity (CC) was .24, which is significant at the .05 level ($r_{.05,df = 73} = .24$, $p = .05$). This finding seemingly provides support for Hypothesis 1, which predicts that a positive, significant relationship between ACR and CC will be observed. However,

inspection of the correlations for males and females demonstrated that this single correlation obscures, rather than clarifies, the relationship between the two variables. The correlation between ACR and CC is .09 for males ($r_{.05,df} = 44 = .29$, n.s.) and .66 for females ($r_{.05,df} = 27 = .37$, $p < .05$). The expected relationship was observed for females but not for males. Apparently, females with high levels of ACR tend to have high levels of CC. In males, these two variables appear to vary independently, so that high levels of one variable can be associated with any level of the other. Thus, Hypothesis 1 was accepted for the female sample and rejected for the male sample. The correlation for the whole group of 75 students, while significant, is presented only to demonstrate the propriety of analyzing male and female groups separately. The implications of these results and those yet to be presented will be discussed in the next chapter.

The data to test Hypotheses 2 and 3 appear in Tables 1, 2, and 3. Table 1 presents the number and direction (+) of significant correlations ($p < .05$, one-tailed) and the number of negative signed correlations (-) reaching the magnitude required for significance. A cursory look at Table 1 suggests that for all students as a group, the hypothesized relationship between ACR and the mood variability measures was confirmed; e.g., high affective complexity (low ACR scores) is associated with high variability scores. Hypothesis 2 was apparently confirmed 22

times and rejected 42 times. Hypothesis 3 was apparently rejected in all 64 tests, suggesting that no relationship exists between cognitive complexity and mood variability.

Table 1

Number and Direction of Significant Spearman Rho Correlations Between Two Complexity Measures and 64 Mood Variability Scores

	Affective Complexity Reflected (ACR)	Cognitive Complexity (CC)
Total[b] Samples $N = 75$	22+[a]	0
Males[c] $n = 46$	17+	13-
Females[d] $n = 29$	2+	24+

Note: The mood variability scores are standard deviations of high, average, low, and high-minus-low scores on the 16 Personal Feeling Scales. Total possible significant correlations = 64 per cell.

[a]All significant correlations were in the positive direction. The number of minus-signed correlations reaching the magnitude required for significance was indicated by a number flagged with a minus sign and may be interpreted as rejections of the hypothesis under test, since all correlations were predicted to be positive.

[b]r_s .05/2, $df = 73$ = .19, one-tailed test

[c]r_s .05/2, $df = 44$ = .25, one-tailed test

[d]r_s .05/2, $df = 27$ = .31, one-tailed test

The results of statistical tests in the male and female samples taken separately raised questions concerning the

appropriateness of the initial interpretations of the total group results presented above. Table 1 shows that affectively complex men (low ACR scores) tend to have low mood variability scores. Hypothesis 2 was confirmed 17 times in the male sample. Table 2 presents the data which were tested in Hypotheses 2 and 3.

Table 2

Intercorrelations Between Two Measures of Complexity and 64 Mood Variability Scores

SDs of Daily Mood Ratings	All Students[a] N = 75		Males[b] n = 46		Females[c] n = 29	
	ACR	CC	ACR	CC	ACR	CC
SDH01[d]	00[e]	-15	16	-04	-21	03
SDA01	13	-06	13	-16	10	20
SDL01	16	01	19	-16	14	39*
SDH02	05	-01	06	-08	-01	16
SDA02	23*	-08	24	-26*	17	29
SDL02	26*	08	24	-17	27	51*
SDH03	15	-08	20	-12	07	-02
SDA03	06	-02	09	02	01	10
SDL03	14	06	08	-02	18	19
SDH04	-05	-08	02	05	-18	07
SDA04	08	-01	15	-05	-03	31*

Table 2 - continued

SDs of Daily Mood Ratings	All Students N = 75		Males n = 46		Females n = 29	
	ACR	CC	ACR	CC	ACR	CC
SDL04	11	06	16	-05	03	38*
SDH05	09	06	19	-25*	-06	27
SDA05	23*	07	29*	-29*	14	40*
SDL05	29*	05	27*	-32*	33*	38*
SDH06	11	-05	16	-12	-10	24
SDA06	16	05	10	-03	17	50*
SDL06	23*	10	24	-20	16	57*
SDH07	19*	-01	27*	-18	06	12
SDA07	23*	19[f]	21	-15	22	37*
SDL07	27*	15	28*	-29*	23	26
SDH08	07	-05	19	-01	-14	23
SDA08	09	-09	30*	-11	-26	-02
SDL08	14	-06	27*	-09	-14	-03
SDH09	09	-05	21	-17	-19	06
SDA09	13	-08	16	-20	03	15
SDL09	28*	10	29*	-08	23	40*
SDH10	03	02	13	-23	-11	27
SDA10	23*	07	28*	-27*	13	48*
SDL10	23*	12	31*	-13	10	41*
SDH11	05	-05	13	-26*	-07	28
SDA11	28*	06	35*	-22	09	40*
SDL11	24*	06	31*	-16	15	43*

Table 2 - continued

SDs of Daily Mood Ratings	All Students N = 75		Males n = 46		Females n = 29	
	ACR	CC	ACR	CC	ACR	CC
SDH12	01	-08	07	-30*	-11	21
SDA12	05	09	-00	-11	09	36*
SDL12	20*	09	18	-10	20	36*
SDH13	01	-16	18	-18	-26	-10
SDA13	20*	-11	19	-34*	19	21
SDL13	38*	03	40*	-16	36*	31*
SDH14	-04	-09	03	-38*	-13	35*
SDA14	20*	04	19	-30*	19	51*
SDL14	15	08	16	-20	10	44*
SDH15	11	-08	16	-36*	04	30
SDA15	21*	10	23	-18	18	51*
SDL15	25*	18	30*	-01	12	45*
SDH16	02	-06	19	-21	-29	16
SDA16	27*	05	37*	-22	09	46*
SDL16	27*	06	35*	-20	15	49*
SDHL01	00	-16	15	-31*	-26	01
SDHL02	15	10	16	-06	18	30
SDHL03	13	-02	13	-04	05	04
SDHL04	16	11	24	02	02	22
SDHL05	12	04	11	-17	11	16
SDHL06	10	04	21	-11	-11	23
SDHL07	14	-12	29*	-18	-09	-05

Table 2 - continued

SDs of Daily Mood Ratings	All Students N = 75		Males n = 46		Females n = 29	
	ACR	CC	ACR	CC	ACR	CC
SDHL08	07	-13	18	-21	-16	02
SDHL09	23*	10	34*	01	08	21
SDHL10	03	02	09	02	-11	03
SDHL11	07	00	12	-10	-01	19
SDHL12	06	08	13	-19	-10	07
SDHL13	15	-04	24	-08	02	-01
SDHL14	07	01	16	-11	-05	19
SDHL15	08	-03	19	-08	-09	08
SDHL16	09	-02	21	-16	-11	21

[a] r_s .05/2, df = 73 = .19, one-tailed test

[b] r_s .05/2, df = 44 = .25, one-tailed test

[c] r_s .05/2, df = 27 = .31, one-tailed test

[d] This variable designation and others in the table are explained in the List of Abbreviations.

[e] All decimal points have been omitted. A correlation of .16 is represented as 16.

[f] r_s = .1853, p = .056

*$p \leq .05$

Significant correlations (which appear in parentheses) were obtained in the male sample between ACR and the standard deviations of Scale V: Harmony vs. Anger (average, .29; low, .27); Scale VII: Companionship vs. Being Isolated

(high, .27; low, .28; high-low, .27); Scale VIII: Love and Sex (average, .30; low, .27); Scale IX: Present Work (low, .29; high-low, .34); Scale X: Thought Processes (average, .28; low, .31); Scale XI: Tranquility vs. Anxiety (average, .35; low, .31); Scale XIII: Personal Moral Judgement (low, .40); Scale XV: Energy vs. Fatigue (low, .30); Scale XVI: Elation vs. Depression (average, .37; low, .35).

Summarizing these data reveals that in the male sample, ACR was significantly related to one high value, five average values, nine low values and two high-minus-low values. This trend may be seen more clearly in Table 3 where the number of significant correlations with the standard deviations of scores on high, average, low, and high-minus-low variables are presented.

At the .05 level of significance, one would expect to find about one correlation significant by chance in a group of 16 correlations (.05 x 16 = .8). Observation of the distribution of significant correlations among the four categories suggests that high affective complexity is associated with low amounts of variability in ratings of average levels of mood and lowest levels of moods. The finding that ACR is related to standard deviations of high-minus-low scores on two scales suggested caution in accepting the hypothesis that high affective complexity is related to small amounts of variation of the mean daily range across days. The hypothesis that high affective complexity is related to low variability of high ratings across days did not receive

Table 3

Number and Direction of Spearman Rho Correlations Between Two Complexity Measures and Four Categories of Mood Variability Scores

	High	Average	Low	High Minus Low
ACR				
Males $\underline{n}$ = 46	1+[a]	5+	9+	2+
Females $\underline{n}$ = 29	0	0	2+	0
CC				
Males $\underline{n}$ = 46	5-	5-	2-	1-
Females $\underline{n}$ = 29	1+	10+	13+	0

Note: The mood variability scores are standard deviations of high, average, low, and high-minus-low scores on the 16 Personal Feeling Scales. Total possible significant correlations = 16 per cell.

[a]See Table 1, superscript a.

support above the chance level and therefore was rejected.

In the female sample, Hypothesis 2 was confirmed only two times in the 64 tests. Significant correlations were obtained between ACR and the standard deviations of Scale V: Harmony vs. Anger (low, .33) and Scale XIII: Personal Moral Judgement (low, .36). The findings supported the hypothesis that high affective complexity is associated with small amounts of variation in low ratings on the PFS. The hypo-

thesis was rejected for the three other groups of variation variables. Clearly, relying on the total group analysis would have obscured the differential performance of ACR in predicting mood variation in males and females.

These differences are even more striking in the analyses using Cognitive Complexity. In the tests of Hypothesis 3 using the total sample, Hypothesis 3 was rejected 64 times (see Table 1). High complex men tend to be more variable than less complex men, which was exactly opposite the predicted relationship. Hypothesis 3 was rejected 64 times for men. In 13 of the tests, the correlations were of sufficient magnitude to have been significant but were negatively signed, which suggested the opposite of the hypothesis might be true (see Table 2). Table 3 reveals that these correlations are concentrated in cells dealing with variability of high and average ratings on the Personal Feeling Scales.

In the female sample, Hypothesis 3 was confirmed 24 times; i.e., high cognitively complex females (low CC scores) tend to have low mood variability scores (see Table 1). Significant correlations were obtained between CC and the standard deviations of Scale I: Fullness vs. Emptiness of Life (low, .39); Scale II: Receptivity Towards and Stimulation by the World (low, .51); Scale IV: Personal Freedom vs. External Constraint (average, .31; low, .38); Scale V: Harmony vs. Anger (average, .40; low, .38); Scale VI: Own Sociability vs. Withdrawal (average, .50; low, .57); Scale

VII: Companionship vs. Being Isolated (average, .37); Scale IX: Present Work (low, .40); Scale X: Thought Processes (average, .48; low, .41); Scale XI: Tranquility vs. Anxiety (average, .40; low, .43); Scale XII: Impulse Expression vs. Self-Restraint (average, .36; low, .36); Scale XIII: Personal Moral Judgement (low, .31); Scale XIV: Self-Confidence vs. Feelings of Inadequacy (high, .35; average, .51; low, .44); Scale XV: Energy vs. Fatigue (average, .51; low, .45); Scale XVI: Elation vs. Depression (average, .46; low, .49). This group of relationships is characterized by correlations of relatively high magnitude with many of the 16 scales. A review of Tables 2 and 3 reveals that women with high cognitive complexity (low CC scores) tend to have low variability of average and low ratings on most of the mood scales. However, CC appears to have no well defined relationship with variability of high ratings or high-minus-low scores. Hypothesis 3 was accepted for two groups of correlations and rejected for two groups.

A review of the findings presented above suggests that high affective complexity in men is associated with low mood variability, as was predicted, but AC level in women appears to have very little relationship to mood variability, with the exception of two correlations which reflect a tendency for high AC women to have lower variability of low ratings on two of the 16 scales. The data in Table 3 also show that high levels of cognitive complexity in women are associated with low mood variability, particularly on

ratings of average and low points. Contrary to prediction, the opposite relationships were obtained for men. High CC seems to be associated with high mood variability.

Contradictory evidence concerning the generality of complexity led to the hypothesis that the affective complexity measure (ACR) will correlate more highly than CC with mood variability indices. High-minus-low variables were excluded from the overall comparison of correlations and treated as a separate group by virtue of being derived from high and low scores.

A Sign Test was used to test the hypothesis that ACR correlations with mood variability scores will exceed CC correlations with the same scores. The ACR correlations were significantly higher than the CC group of correlations ($z = 6.48$, $p < .00003$, one-tailed test). In the female sample, this hypothesis was strongly rejected ($z = -6.20$, $p > .99997$, one-tailed test).

High-minus-low score correlations with ACR and CC were tested separately using the Sign Test for small samples. The sample size was the number of pairs of correlation coefficients ($n = 16$). In the male sample, the ACR correlations with high-minus-low scores significantly exceeded the magnitude of CC correlations with the same scores ($x = 16+$, $p < .002$). As in the larger analysis, this hypothesis was strongly rejected for females ($x = 2+$, $p > .998$).

Sign tests were also computed for each set of correlations in the large analysis to see if that analysis had

obscured any differences between ACR and CC correlations with high, average, and low groups of correlations. For males, the analysis reflected the same trends as were found in the large analysis. The ACR correlations with mood variability scores exceeded CC correlations with those scores for high ratings ($\underline{x}$ = 15+, $\underline{p} < .002$), average ratings ($\underline{x}$ = 16+, $\underline{p} < .002$), and low ratings ($\underline{x}$ = 16+, $\underline{p} < .002$). In the female sample, the hypothesis was rejected ($\underline{p} > .998$) for high scores ($\underline{x}$ = 1+), average scores ($\underline{x}$ = 0+), and low scores ($\underline{x}$ = 1+).

A clear pattern of results emerges from the tests of Hypotheses 2, 3, and 4. High affective complexity appears to be related to low amounts of mood variability in men, but these variables do not seem to be related for women. High cognitive complexity in women is associated with low mood variability. In men, high cognitive complexity is associated with high mood variability, which is contrary to the relationship hypothesized.

Analyses parallel to the ones presented above were performed on the means of mood scores. Table 4 presents the number of significant Spearman rho correlations between ACR, CC and the means of the high, average, low, and high-minus-low scores for each of the 16 Personal Feeling Scales.

As previously observed in the standard deviations analyses, striking differences emerged among groups when the correlations were computed on males and females separately and pooled as one group. For the total sample,

Table 4

Number and Direction of Significant Spearman Rho Correlations Between Two Complexity Measures and 64 Mood Mean Scores

	Affective Complexity Reflected (ACR)	Cognitive Complexity (CC)
Total[b] Samples $N = 75$	8+[a]	21+
Males[c] $n = 46$	0	1+
Females[d] $n = 29$	14+	17+

[a]All significant correlations were positively signed. Total possible significant correlations = 64 per cell.

[b]r_s .05, $df = 73$ = .23, two-tailed test

[c]r_s .05, $df = 44$ = .29, two-tailed test

[d]r_s .05, $df = 27$ = .37, two-tailed test

Hypothesis 5 predicts a significant correlation between ACR and each of the 64 mood mean scores. Hypothesis 5 was accepted 8 times and rejected 56 times. Testing this hypothesis in the male and female samples separately revealed that for males Hypothesis 5 was rejected 64 times. No relationship was observed between affective complexity and mood levels. This finding is in contrast with the results of correlations with between-day mood variability indices (SDs). In men, high affective complexity is associated with low between-day mood variability but is unrelated to mood

level. No significant correlations were observed with the 16 mean high-minus-low variables (MHL01 to MHL16) which are indices of within-day variability. Thus, high affective complexity in men is associated with low mood variability across days (SDs) but is not related to within-day variability or mood level across days (high, average, and low scores). Table 5 presents the correlations between ACR, CC, and the means of high, average, low, and high-minus-low (within-day variability) scores.

Hypothesis 5 predicts significant correlations between ACR and the mood mean scores. Table 4 shows that 14 significant correlations and 50 nonsignificant correlations were observed in the female sample. Since these correlations were positive in sign, they suggested that high affective complexity (low ACR score) is associated with low mood levels in the female sample. The mood mean scores (and the correlation coefficients) had significant correlations with ACR on Scale I: Fullness vs. Emptiness of Life (average, .40); Scale II: Receptivity Towards and Stimulation by the World (high, .37); Scale V: Harmony vs. Anger (high, .46; average, .50; low, .48); Scale VI: Own Sociability vs. Withdrawal (high, .37; average, .40); Scale VIII: Love and Sex (average, .40); Scale XII: Impulse Expression vs. Self-Restraint (average, .38); Scale XIII: Personal Moral Judgement (high, .48; average, .50); Scale XV: Energy vs. Fatigue (average, .39; low, .38); Scale XVI: Elation vs. Depression (average, .49). These data are summarized in Table 6.

Table 5

Intercorrelations Between Two Measures of Complexity and 64 Mood Mean Scores

$\bar{X}$ of Daily Mood Ratings	All Students[a] N = 75		Males[b] n = 46		Females[c] n = 29	
	ACR	CC	ACR	CC	ACR	CC
MH01[d]	16[e]	25*	03	21	30	30
MA01	13	29*	-05	23	40*	36
ML01	08	17	-05	06	33	35
MH02	25*	25*	15	21	37*	24
MA02	21	28*	13	25	32	42*
ML02	08	12	02	07	18	31
MH03	12	24*	06	16	18	33
MA03	14	27*	05	13	24	50*
ML03	07	11	03	-10	08	41*
MH04	19	17	16	16	23	17
MA04	16	15	13	14	21	15
ML04	03	03	-02	-04	09	08
MH05	29*	19	17	07	46*	30
MA05	28*	21	13	07	50*	42*
ML05	16	14	-01	-04	48*	46*
MH06	17	29*	02	20	37*	41*
MA06	16	21	-01	16	40*	34
ML06	03	05	-12	-05	28	29
MH07	23*	22	17	08	31	33
MA07	18	18	10	04	28	38*

Table 5 - continued

Xs of Daily Mood Ratings	All Students N = 75		Males n = 46		Females n = 29	
	ACR	CC	ACR	CC	ACR	CC
ML07	07	05	-01	-14	19	44*
MH08	22	16	22	11	18	15
MA08	31*	21	23	12	40*	33
ML08	23*	15	19	-02	29	45*
MH09	17	24*	18	20	14	22
MA09	21	20	22	20	19	18
ML09	06	08	05	01	06	18
MH10	18	32*	07	22	30	37*
MA10	16	35*	02	21	36	47*
ML10	02	15	-12	-01	26	48*
MH11	16	20	13	21	21	19
MA11	22	25*	12	26	35	20
ML11	09	15	-04	07	36	19
MH12	15	31*	08	19	27	41*
MA12	18	29*	08	15	38*	50*
ML12	02	10	-07	-03	21	35
MH13	27*	40*	11	19	48*	58*
MA13	27*	38*	11	20	50*	61*
ML13	09	23*	-09	-02	36	64*
MH14	15	27*	09	17	24	35
MA14	17	29*	10	21	25	35
ML14	-00	14	-10	-00	12	35

Table 5 - continued

$\bar{X}$s of Daily Mood Ratings	All Students N = 75		Males n = 46		Females n = 29	
	ACR	CC	ACR	CC	ACR	CC
MH15	19	21	10	14	32	24
MA15	21	26*	08	23	39*	22
ML15	09	15	-07	10	38*	23
MH16	14	29*	08	25	17	28
MA16	20	32*	02	26	49*	34
ML16	04	13	-09	09	28	16
MHL01	-01	07	03	12	-03	-01
MHL02	11	11	05	16	17	07
MHL03	-00	09	00	21	-02	-13
MHL04	04	19	07	21	01	15
MHL05	07	05	13	12	-01	-06
MHL06	05	13	09	17	04	10
MHL07	08	17	10	23	06	04
MHL08	-04	07	-06	19	-05	-15
MHL09	-02	21	-06	27	06	19
MHL10	06	20	04	25	13	18
MLH11	-04	06	09	15	-24	-11
MHL12	03	20	01	19	03	20
MHL13	11	21	06	30*	20	05
MHL14	05	15	02	24	13	08
MHL15	00	09	05	10	-08	04
MHL16	01	10	12	09	-17	05

Table 5 - continued

[a] r_s .05, df = 73 = .23, two-tailed test

[b] r_s .05, df = 44 = .29, two-tailed test

[c] r_s .05, df = 27 = .37, two-tailed test

[d] This variable designation and others in the table are explained in the List of Abbreviations.

[e] All decimal points have been omitted. A correlation of .16 is represented as 16.

*p .05

Comparing the observed frequencies of correlations in Table 6 with the chance expectation of one significant correlation per cell suggests that high levels of affective complexity (low ACR scores) in women are associated with low mean mood levels on high and average ratings on the PFS. The incidence of two significant correlations with mean low ratings suggested cautiously accepting the hypothesis that high levels of affective complexity in women are associated with low mean ratings on low ratings on the PFS. The absence of any significant correlations with high-minus-low scores in the female sample suggested that ACR is not related to witnin-day variability of mood level, and Hypothesis 5 was rejected for this group of 16 variables.

The data presented in Tables 3 and 6 summarize all the relationships between affictive complexity and 128 mood variables. Widely divergent trends became apparent when these relationships were evaluated for men and women

Table 6

Number and Direction of Spearman Rho Correlations Between Two Complexity Measures and Four Categories of Mood Mean Scores

	High	Average	Low	High Minus Low
ACR				
Males $\underline{n}$ = 46	0[a]	0	0	0
Females $\underline{n}$ = 29	4+	8+	2+	0
CC				
Males $\underline{n}$ = 46	0	0	0	1+
Females $\underline{n}$ = 29	4+	7+	6+	0

Note: The mood mean scores are means of high, average, low, and high-minus-low scores on the 16 Personal Feeling Scales. The high-minus-low scores are an index of within-day mood variability. Total possible significant correlations = 16 per cell.

[a]All significant correlations were positively signed.

separately. High levels of affective complexity in men are associated with low between-day variability of mood ratings as measured by the standard deviation of daily mood ratings. Affective complexity levels in women do not seem to be related to these scores. These sex differences were reversed in the relationships between affective complexity and mean mood level. High levels of affective complexity in women

are associated with lower hedonic level as measured by means of daily ratings on the mood scales. No significant relationship was observed between affective complexity and mood level in the male sample. The mean of the high-minus-low ratings provides an index of within-day variability for each of the 16 mood scales. Affective complexity levels were not associated with mean levels of within-day variability for either sex, with the exception of two significant correlations for men. This number exceeds the chance level of 18 but should be interpreted with caution.

As in the previous analyses, the test of Hypothesis 6 (CC) in the total sample obscured the different findings for males and females obtained in the separate samples. Table 4 shows that Hypothesis 6 was accepted 21 times and rejected 43 times for the total sample. Further examination of this table shows that in the male sample, Hypothesis 6 was accepted once in the 64 tests. Males with high levels of cognitive complexity had low within-day variability (H-L) on Scale XIII: Personal Moral Judgement (.30).

In the female sample, the results of the tests of the hypothesis using CC and mood mean scores suggests that women with high levels of cognitive differentiation experience low mood levels. Hypothesis 6 was accepted 17 times and rejected 47 times in the 64 tests. Significant correlations were obtained between CC scores and the means of Scale I: Fullness vs. Emptiness of Life (average, .40); Scale II: Receptivity Towards and Stimulation by the World (average,

.42); Scale III: Social Respect vs. Social Contempt (average, .50; low, .41); Scale V: Harmony vs. Anger (average, .42; low, .46); Scale VI: Own Sociability vs. Withdrawal (high, .41); Scale VII: Companionship vs. Being Isolated (average, .38; low, .44); Scale VIII: Love and Sex (low, .45); Scale X: Thought Processes (high, .37; average, .47; low, .48); Scale XII: Impulse Expression vs. Self-Restraint (high, .41; average, .50); Scale XIII: Personal Moral Judgement (high, .58; average, .61; low, .64). No significant correlations were observed between CC and the 16 high-minus-low variables in the female sample. Level of cognitive complexity was not associated with variation of mood levels within days. Table 6 summarizes these results. Compared to the chance expectation of one significant correlation per cell, Hypothesis 6 was accepted for three types of ratings (H, A, and L) and rejected for one (H-L). High levels of cognitive complexity in women is associated with low mean scores on high, average, and low ratings on the Personal Feeling Scales.

Hypothesis 7 predicts ACR correlations with mean mood scores will exceed CC correlations with mean mood scores. The Sign Test for large samples was used to test the two groups of high, average, and low correlations. Since no predictions were made concerning the signs of the correlations, the absolute values of the coefficients were used in all tests of the hypothesis. In the male sample, this hypothesis was rejected ($z = -2.51$, $p = .994$). The results

suggest that CC correlations are higher than ACR correlations with mean mood scores. Tests of the four groups of 16 coefficients revealed that ACR correlations did not exceed CC correlations with high ratings ($\underline{x}$ = 3+, $\underline{p}$ = .982), average ratings ($\underline{x}$ = 4+, $\underline{p}$ = .962), low ratings ($\underline{x}$ = 7+, $\underline{p}$ = .500), or high-minus-low scores ($\underline{x}$ = 2+, $\underline{p}$ = .988). The evidence suggests that CC correlations with high, average, and high-minus-low scores exceeded ACR correlations with these mean scores. Only one correlation coefficient was significant (CC with MHL13) among the 128 involved in these tests. CC correlations do exceed ACR correlations, but neither variable accounts for significant amounts of variance in mood mean scores.

In the female sample, the test of Hypothesis 7 was more meaningful since both ACR and CC are related to several mood mean scores. The Sign Test was used to test the prediction that ACR correlations will exceed CC correlations with mood mean scores. For the high, average, and low correlations taken as one group, Hypothesis 7 was rejected ($\underline{z}$ = -1.23, $\underline{p}$ = .891); ACR correlations with these 48 mood mean scores do not exceed CC correlations with the same scores. This hypothesis was also rejected in each of the four groups of 16 correlations. ACR correlations do not exceed CC correlations with the means of high ratings ($\underline{x}$ = 6+, $\underline{p}$ = .696), average ratings ($\underline{x}$ = 9+, $\underline{p}$ = .315), low ratings ($\underline{x}$ = 5+, $\underline{p}$ = .895), or high-minus-low scores ($\underline{x}$ = 8+, $\underline{p}$ = .598).

Hypotheses 8 and 9 were tested using the approximate test described by Kendall (1970). If the difference (D) between correlations exceeded the product (ZSE) of the z score and standard error, the hypothesis was accepted. Hypothesis 8 predicts the ACR correlation with the mean high-minus-low scores on the Elation vs. Depression scale will exceed the CC correlation with the same scores. Since the sign of the correlations was not predicted, the absolute difference was computed between the ACR coefficient of .12 and the CC coefficient of .09. No significant difference was observed ($D = .03$, $ZSE = .59$, $p > .05$). In the female sample, the ACR coefficient of -.17 was not significantly larger than the CC coefficient of .15 ($D = .02$, $ZSE = .74$, $p > .05$). ACR does not demonstrate a stronger relationship with the mean daily range on the Elation vs. Depression scale when compared to the CC relationship with this major within-day mood variability score.

Hypothesis 9 predicts the ACR correlation coefficient (.37) with the major between-day variability index (SDA16) will be larger than the CC coefficient of -.22 with SDA16 in the male sample. Since the sign of the coefficients had been predicted to be positive, the algebraic difference was computed ($D = .59$) and found to exceed the critical value ($ZSE = .56$, $p < .05$). For males, high affective complexity is more strongly associated with lower levels of mood variability. In the female sample, the hypothesis was rejected. The ACR correlation of .09 did not exceed the CC

correlation of .46 with the mood variability index ($D = -.37$, $ZSE = .71$, $p > .05$).

DISCUSSION

The relationship between Affective Complexity Reflected (ACR) and Cognitive Complexity (CC) characterizes all of the results obtained in this investigation. These variables accounted for 43.6% of the variance in each other in the female sample (r = .66) but were not significantly related for men (r = .09). Some relationship was expected between the variables, accounting for perhaps 15 to 20% of the variance. These findings suggest that the two variables operate as separate aspects in males, but as highly related styles in women. This thesis will be more fully developed following further examination of the data, which will proceed without further reference to group data. In all tests of hypotheses, the group analysis obscured, rather than clarified, relationships. Previous research had suggested this finding.

The major hypothesis of this study is that complexity can be assessed in the framework of Kelly's (1955) Psychology of Personal Constructs; once assessed, complexity can account for significant amounts of variance in mood level. In the 256 correlations with standard deviations of mood scales, 21.9% (56) reached statistical significance. This finding suggested that this is correct.

High levels of affective complexity are associated with low mood variability in males on a variety of scales which tap diverse dimensions of mood. These scales include Personal Moral Judgement, Elation vs. Depression, Tranquility vs. Anxiety, Harmony vs. Anger, as well as seemingly unrelated aspects of mood in the areas of work, and flow of thought processes. High affective differentiation in men is associated with better control of between-variation in rating levels of happiness, tenseness, anger; judgement of moral worth, anxiety, thought flow, satisfaction with work, love and sex, and feelings of companionship. The control of variation is most apparent in average and low ratings. Women with highly differentiated affective systems have control over variation of lowest levels of anger and personal moral judgement. Nonsignificant trends were observed suggesting that affectively complex women control the variation in low ratings for other moods but have higher variation in their report of peak levels of moods. High complex women may relinquish some control of high mood levels in order to control variation of low mood limits. The small number of significant correlations suggests ACR may be related to variability of low ratings; data are not yet available to warrent acceptance of these other possible trends.

Females with high cognitive complexity reported small amounts of mood variation in almost every area of mood assessed by the Personal Feeling Scales. The most effec-

tive control is exerted over variation in average and lowest ratings of sociability, self-confidence, energy, and happiness. Moderate control was observed for average and low ratings for most other moods. A nonsignificant tendency to control variability of high ratings was also observed. Men with high cognitive differentiation reported large variation of high or average ratings of happiness, self-confidence, harmony, tranquility, impulse expression, and personal moral judgement. Most of the nonsignificant correlations are negatively signed which suggests a tendency for cognitively complex men to report high day-to-day variability for most moods, which is contrary to predictions. Clearly, mood variation is best explained by affective complexity levels in men and cognitive complexity levels in women.

Wessman and Ricks (1966) reported the relationship between ranks of stability and affective complexity (AC). The standard deviation (SDA16) of average ratings on the Elation vs. Depression scale was used as the index of stability. For men the correlation between AC and SDA16 was .57 ($p < .01$). In this study, ACR and SDA16 yielded a correlation of .37 ($p < .05$) in men. The CC correlation with SDA16 was -.22 (n.s.), suggesting a trend towards more variation at higher CC levels. The ACR result parallels the finding of Wessman and Ricks. The correlation between AC and SDA16 in their female sample was .26 (n.s.). In this study the correlation was .09 (n.s.), which again parallels their findings. However, the CC correlation with

SDA16 was .46 ($p < .05$). High CC was associated with low variability where ACR demonstrated few significant relationships. This finding suggests that ACR and CC function differently in relation to female mood variability, although the correlation between ACR and CC is high ($r = .66$). Affective variation in men is governed by affective complexity, but in women high cognitive complexity is associated with low variability.

The relationships between ACR, CC, and mood variability scores are the major focus of this study ACR appears to control mood variation in men much as the Wessman and Ricks measure (AC) does, and fails to control mood variation in women much as AC failed. The success of CC in explaining female mood variation was predicted, but such success was not expected in the situation where ACR was unsuccessful in explaining mood variation. These similar findings with respect to ACR and AC suggest that affective complexity has value as an explanatory variable in mood variability research. The two measures were derived by two very different techniques and tested in different samples, yet demonstrate similar success in explaining mood variation in men, as well as demonstrating similar lack of success in explaining mood variation on women.

The analysis of mean mood level was a speculative undertaking. Wessman and Ricks (1966) found a nonsignificant trend for unhappiness in men with high AC levels, but no relationship in women. Balancing that data was the

belief that affective differentiation may afford better understanding and control of affective stimulation, thereby allowing affectively complex persons to enjoy higher moods. Neither hypothesis compelled adoption over the other, so a significant but unspecified relationship was hypothesized between AC, CC, and mean mood levels while still hypothesizing that AC and CC are best at explaining mood variation. Analysis of mean scores in the men revealed that CC is related to lowered mean daily range of personal moral judgement. Cognitive differentiation aids men in keeping the variability of moral judgements about themselves at low levels within-days. Examination of the remaining nonsignificant correlations revealed trends for high cognitive complexity to be associated with low mean within-day variability of all the mood scales, paritcularly in the areas of social respect, personal freedom, companionship, satifaction with work and thought processes, and self-conficence. Nonsignificant trends were also observed between high cognitive complexity in males and lower mean levels of high and average ratings of elation, tranquility, responsiveness to stimulation in the world, a sense of fullness of life, satisfaction with work and thought processes, and personal moral judgement. These trends suggest lower mood levels may be associated with high cognitive complexity. If this trend is combined with the trend toward lower daily ranges, it could be hypothesized that cognitively complex men control mood levels by holding down positive moods and

allowing negative moods to vary without much control. The perponderance of nonsignificant correlations between CC and variability scores in men required the rejection of the hypothesis of relationship between CC, mean mood level, and witnin-day variability until these trends are confirmed by future research.

Females with high cognitive differentiation reported low mean levels of personal moral judgement on high, average, and low ratings but did not report low daily ranges on this scale as men did. They also reported low mean levels of ratings (usually A & L) indicating feelings of emptiness of life, social contempt, nonresponsiveness to environmental stimulation, social withdrawal, anger, isolation, lack of satisfactory sexual feelings, slow thought processes, and self restraint. Nonsignificant correlations suggest this control also is associated with some lowering of high ratings on these scales. These findings suggest that cognitively complex women may be aware of moral shortcomings and are sensitive to possible negative evaluations from others concerning social roles, perhaps love relationships or sexual roles in particular. These cognitively complex women present a picture of social and behavioral withdrawal and a trend toward unhappiness. They also reported little variability in mood (SD analysis) which suggests a very tight, controlled, affective life.

Affectively complex females also report lowered ratings concerning anger and personal moral judgement, lower re-

ceptivity to the world, feelings of emptiness, social withdrawal, self restraint, lack of sexual satisfaction, fatigue, and unhappiness. Women who are affectively or cognitively complex (or both), structure their lives such that they report lower mean mood levels.

Affective complexity levels in men control mood variability but apparently have very little relationship to mean mood level. Nonsignificant correlations suggested a tendency for affectively complex men to report more anger, sexual frustration, and dissatisfaction with work, but more of the correlations between ACR and mood level reached statistical significance in the male sample.

The relationships between ACR and mood variability in this study support the findings of Wessman and Ricks. The relationships between mean mood levels and affective complexity in the two studies are somewhat different. Both studies assessed the relationship between affective complexity and average mood level on the Elation vs. Depression scale (MA16). In the earlier study, the relationship between AC and MA16 was -.30 (n.s.), which indicated a slight trend for affectively complex males to be less happy. The ACR, MA16 correlation in this study was .02, which suggests no relationship exists between affecitve complexity and hedonic level. However, the CC correlation was .26, which (because of scoring reversals) also represents a nonsignificant trend for cognitively complex men to report lower levels of happiness. This trend suggests that CC may ex-

plain hedonic level better than ACR in men.

In the Wessman and Ricks study, AC and female hedonic level were not related (r_s = .23, n.s.). Females in this study had a correlation of .49 between ACR and MA16, which suggested that high affective complexity is associated with low mood level. A nonsignificant correlation (r_s = .34, n.s.) between CC and MA16 suggests the two complexity scores used in this study vary together in explaining hedonic level in women.

The relationship between ACR and MA16 is similar to the Wessman and Ricks finding of no relationship between affective complexity and hedonic level in men. In the female sample, ACR was related to mood level. Due to the reversal in scoring for ACR, the positive coefficient suggests high affective complexity is associated with low mood level while the coefficient reported for females in the earlier study (.23) would indicate high mood level was associated with AC if the coefficient were significant. The trend suggests caution in equating the two affective complexity indices.

It should be noted that experimenters take risks in comparing their data to the work of others, since a presumption of equivalence of samples must usually be made. In the Wessman and Ricks (1966) study, such a presumption is particularly dangerous. They preselected students on the basis of four unvalidated screening measures which included "happiness-unhappiness." After dividing students

into quartiles, they selected men from the extreme quartiles, using the ratio of 2:1 with respect to the moderate quartiles. Thus, students representing extremes of happiness-unhappiness comprised two-thirds of the sample. Wessman and Ricks noted that this bias may have inflated the statistical significance of some of their results.

The decade that passed between the collection of the Wessman and Ricks data and the data reported here, was marked by significant changes in college populations. The Viet Nam War may have motivated some students to enter or remain in universities who would have chosen other activities in times of peace.

Wessman and Ricks studied highly motivated, elite students. Male students were involved in an ongoing 3-year research project for which they were paid; the University of Florida students who participated in this study were (at least initially) trying to fulfill experimental course requirements. However, in this study the experimenter was available during the day in the research room, and many students used this opportunity to come in and discuss research, graduate school, personal problems, difficulties with the mood scales, and "things in general." As the course of the experiment progressed, the motivation of several students seemed to increase, perhaps as a result of these conversations. Since I filled out the scales before and during the experiment, I was in a position to empathize and commiserate accurately with students who were not

"in the mood" to rate their moods.

One indication of high motivation in at least some students came from detailed comments and explanations of ratings that some wrote on the back of their forms. In some cases these comments ran well over two handwritten pages. Others continued to fill out the scales during rather unusual cirdumstances. One young lady filled out her forms on her honeymoon while two men continued to do so during deaths in the family. A number of records like these provided rich, detailed views of the affective natures of their authors. Excellent examples of such case studies may be found in Wessman and Ricks (1966).

Another limitation on comparing the two studies involves the time periods sampled. Wessman and Ricks collected six weeks of mood data; this study covered three weeks. It might be assumed that six weeks provides a much better sample of affective life than three weeks. Some students in this study completed over 5 weeks of ratings, but to avoid statistical difficulties, these extra days were ignored in the statistical analyses. However, the essential findings regarding affective complexity were replicated, which suggests that 3 weeks may be an adequate sample. The wider ranges of mean hedonic level observed in this investigation suggest that the 3-week period may provide more valid data concerning extreme moods by avoiding habituation effects that may accrue as mood-rating periods increase in length. A week-by-week trend analysis of mood level and variability

data would be a valuable contribution to the mood literature.

Despite all of the differences between subjects, procedures, and complexity measures between the two studies, the results of the Wessman and Ricks (1966) study and the present study are consistent with each other. However, since no cognitive complexity measures were included in the Wessman and Ricks study, CC could not be directly compared.

A recent study (Gorman & Wessman, 1974) has as its foci, cognitive styles and mood. Gorman and Wessman factor analyzed 33 measures of cognitive style which included measures of field articulation, temporal orientation and future expectation, language facility, locus of control, defensiveness, social desirability, and rigidity. These scores were factor analyzed resulting in eight orthogonal factors.

Gorman and Wessman also factor analyzed 4 weeks of PFS ratings. Four indices of mood differentiation were extracted. Low differentiation was measured by proportion of variance accounted for by the first factor, and by average intercorrelation of the mood ratings. The measures of high differentiation were: number of factors that account for 90% of the variance, and number of factors accounting for 10% or more of the variance. The means, standard deviations, and daily ranges of 14 PFS scales were extended into the factor structure along with the four mood differentiation measures. Extension is a process that estimates

loadings of new variables on an already existing factor structure without changing the original factor structure. The 20 men and 47 women were pooled for the analysis since few differences emerged between groups, and factor structures were nearly the same. Men employed wider category widths and left more objects ungrouped in an object sorting task. Other small differences were observed.

Factor I was named Subjective Hope and Confidence. No mood variables had appreciable loadings on that factor. Factor II was Sensation-Seeking and Openness and had most of the mood variables loaded upon it. Strongest loadings were observed for "peak" mood level ratings. Neither within- or between-day variability measures loaded here but three of the four mood differentiation factors had loadings which indicated sensation seekers had low affective complexity.

Factor VI, Narrow vs. Broad Conceptual Bandwidth accounted for 8% of the variance and was formed with the Pettigrew Category Width Test (negative loading), the Calabresi and Cohen Time Possessiveness and Time Anxiety Tests, the number of groups formed on the Clayton and Jackson Object Sorting Test. Gorman and Wessman expected more tests of conceptual differentiation and categorization measures to load on this factor. No mood scores loaded on this factor. It was hypothesized that equivalence range or categorization styles would be negatively correlated with mood variability and positively correlated with mood differentiation. The hypothesis was rejected.

Factor VII was named Field Articulation (Field Independence). It accounted for 7% of the variance. Tests which comprised the factor were the ETS Hidden Patterns Test, ETS Hidden Figures Test, ETS Advanced Vocabularly Test, and the Calabresi and Cohen Time Anxiety Test. High scorers on this field articulation factor were field-independent. PFS variables which loaded .30 or more on this factor were 6 of 14 "trough" mood level measures, freedom from academic work pressure, the "average" score on present work satisfaction scale, and reflected a work emphasis. Field independence was associated with low between-day variation on many "peak", "average", and "trough" standard deviations. Contrary to hypotheses, none of the mood differentiation measures or the within-day variability scores had appreciable extension loadings on this factor.

Factors VI and VII are relevant to a discussion of cognitive differentiation (CC). Although many differentiation measures were included in the factor analysis, only a few loaded on Factor VI. One test which did not was Scott's Nation Sorting Test (1962). In this task the subject is asked to name important countries and form as many meaningful groups as he can. Two measures of differentiation that are sometimes used with sorting tasks are forming many groups and leaving few nations ungrouped. In Scott's (1962) paper he takes the scoring procedure further by computing H, the information theory measure of dispersion which may be regarded as the number of groups-worth of

information (dimensional complexity). Gorman and Wessman (1974) do not mention use of this measure. Thus, using number of groups as the score makes the test into something which may measure complexity and differentiation but which also may measure another attribute of cognitive style. By failing to use the H, measure, the factor which emerged may not measure differentiation in the way that the factor analytic mood differentiation measures do or in the way CC and ACR do. This procedural consideration may explain the failure of the mood differentiation measures to load on Factor VI.

Leitner, Landfield, and Barr (1975) noted the same sort of procedural problems in Vannoy's (1965) investigation of cognitive complexity. Vannoy factor analyzed 20 measures of cognitive complexity and extracted eight factors, the largest of which accounted for 24.3% of the common variance. Leitner et al. noted that Vannoy's decision to modify Scott's (1962) Nation Sorting Test may have changed the test such that it no longer measures CC.

Gorman and Wessman predicted mood differentiation scores would load on Factor VII: Field Articulation (Field Independence). Field independence did relate to low mood variability as a measure of differentiation or complexity might relate, but no relationship was observed between field independence and mood differentiation and complexity scores. No hypothesis was advanced concerning the meaning of that finding.

Attempts to find a simple description of processes to explain the pattern of results in this study have met with little success. The initial finding of the study was an enigma; levels of ACR and CC were strongly related in women but not in men. In an attempt to understand the factors contributing to differential performance of and relationships between ACR and CC for men and women, the issue of reliability was reassessed. The realization that reliabilities of the ACR and CC instruments were the only two correlations computed for the pooled group alone, led to recomputation of correlations for the 16 males and 14 females in the mood study who also participated in the reliability study. The earlier CC coefficient of .82 seemed to accurately reflect the new coefficient for males of .79 ($p < .001$) and for females of .84 ($p < .001$). The original ACR reliability coefficient was .52, which seemed adequate for initial use but might be improved for further investigations. Separate analyses revealed the coefficient for women was very acceptable at .81 ($p < .001$) but marginal for men at .38 ($p = .15$)

This puzzling finding led to examination of descriptive statistics for males and females for CC and ACR. Males and females tended to increase scores on CC, i.e., became slightly more simple. With ACR a slight drift occurred toward simplicity in females, but this effect was more pronounced in males. This parallels Epting's (1772) finding of drift towards simplicity in construing social issues.

However, CC and ACR scores from the first administration were almost identical in means and standard deviations for males and females. The scores from that administration were used for all tests of hypotheses. The significance of that drift is not clear in view of the explanatory power of ACR for men. ACR was associated with mood variability as had been predicted in the male sample. One possible explanation for the differential performance of men in the reliability study is that volunteers were few during that summer and repeated requests for participation in the reliability study were made. Possibly, motivation to perform well was lacking in some participants. Very few males had volunteered for the reliability study. It is possible that some male students agreed to participate rather than be subjected to repeated requests for participation. The ACR task is a very demanding one that required the determined efforts of the examinee to obtain an accurate picture of affective constructs and their differentiation. If the students were participating in the reliability study with less than their full cooperation, increased simplicity might be the result. A future reliability study is indicated to resolve this question.

The recent research literature on complexity has raised several issues that were not addressed in this investigation. A number of investigators have noted that Kelly's (1955) Personal Construct Theory addresses the issue of integration as well as differentiation. Kelly has

proposed constructs as ways we differentiate aspects of our world. These constructs are then organized into systems of similar constructs. One method of organizing construct systems is through the use of superordinate constructs. These constructs are high level constructs with broad ranges of convenience such that they can differentiate many events. Examples of these constructs might be good-bad, liked-disliked, and happy-sad. Specific constructs with narrower ranges of convenience are integrated hierarchically with more general constructs being more central in the construct system.

It is possible that some persons prefer integration rather than differentiation as a basic strategy for understanding their world. Zimring (1971) provided evidence to support the view that failure to use constructs in differentiated ways may be a function of judging constructs as similar by using a number of differentiated judging categories in complex ways. Langley (1971), Hearn and Seeman (1971), and Thomas and Seeman (1972) have all provided evidence to suggest that integration taps different aspects of cognitive functioning that may be just as effective or complex as differentiating styles. Smith and Leach (1972) have noted a lack of correspondence between measures of hierarchial CC and differentiating CC. However, Epting and Wilkins (1974) found the Bieri Reptest measure of differentiation correlated with two measures of integration.

Unfortunately, these articles were not available when

the research was designed, so no procedures were built in to assess the possible differences between high level differentiators and high level integrators or abstractors; apparently, this is a most fruitful approach to take in future studies of complexity. One can only speculate as to the actual effect of these different styles in the present research. Bryson and Driver (1972) have domonstrated that extraversion is associated with preference for complexity regardless of CC level. They advanced the hypothesis that some segments of the population prefer attending to internal stimuli while others prefer exterior stimulation. These studies provided hypotheses which can be applied to the results of this study.

The failure of affective complexity scores to predict mood variability scores for women in the Wessman and Ricks (1966) study and in this investigation lends support to the hypothesis that females and males structure the affective domains of their experience in such different ways that our male-dominated conceptualizations of mood may be inapplicable to female affective domains. The success of CC in explaining mood level and variability in women suggests a re-examination of mood correlates is in order, particularly with respect to variability.

Cognitive complexity seems to have special relevance to interpersonal domains, while affective complexity suggests that the focus is inward. In the CC measure used in this study, constructs are provided which, perhaps, lowers the

demands for finding the most relevant constructs for construing people. The constructs are applied to people on this list as evaluations of their qualities. In the ACR measure, the focus is inward beginning with elicitation of personal constructs. The person is asked how he feels rather than how he evaluates others. Feelings and evaluations are related but the focus seems to be more intrapersonal than interpersonal when feeling constructs are involved. The CC measure focuses on evaluations of other significant people and may therefore measure interpersonal complexity.

The fact that the ACR measure begins with construing people in an interpersonal domain may explain the high relationship (r = .66) of ACR and CC in women. If we presume that men are more attuned to intrapersonal systems to control and predict the environment, this presumption may explain the lack of relationship (r = .09) of ACR and CC in that sample. If use of the intrapersonal system (ACR) eventually results in a relative disregard for external interpersonal demands (CC), interpersonal construing may become a nonfunctional aspect of personality structure that loses its ties with the more important intrapersonal system. High CC was related to higher mood variability in men. Perhaps trying to use a vestigial system of interpersonal constructs (CC) results in poor predictions with emotionally arousing consequences.

Women are assumed to be social creatures. They may

develop interpersonal complexity at earlier ages than men do and use CC as the superordinate organizing and integrating system. Females generally had higher correlations than men between CC and Sociability vs. Withdrawal. They subsume affective constructs in the larger system where they become useful for identifying, but not controlling, hedonic variability. ACR was related to mood level but not variability. Koenig and Seaman (1974) found that male stimuli are rated more complexly than female stimuli by both men and women, which suggests that, in this culture, being able to understand males is more important than understanding females. Such a condition would be most important for females, but Koenig and Seaman found that males construed males more complexly than females construed males. Speculations must be tempered by data. These findings of different relationships between CC, ACR, and mood level and variation by sex warrant further research.

Perhaps the first project should be reassessing reliability of the ACR measure. Another useful project would be assessing interpersonal and intrapersonal contributions to ACR. If ACR is a diverse measure of intrapersonal and interpersonal events, it would be feasible to construct forms of the ACR Reptest that would vary the amount of interpersonal construing required. The form used in this investigation was focused on feelings in relation to important people in the interpersonal environment. A lower level of interpersonal stimulation might be achieved by

using events as objects to be construed. Some events with interpersonal components might be: parties, working, watching movies, and observing others in various activities. A more intrapersonal set of objects might be: sunrises, sunsets, moon rises, birds soaring, and riding a motorcycle. These forms of the ACR Reptest might be less related to the interpersonal construing required by CC measures.

ACR and CC correlations with the Personal Moral Judgement scale (13) were among the highest in this study. Perhaps dimensionalizing the grids on desirability results in this finding. CC correlations with Scale XIII means tend to be higher than ACR correlations with the same scores. The two largest correlations between complexity and mood scales were between CC and means of average (.61) and low (.64) ratings on the Personal Moral Judgement scale in the female sample. Perhaps moral judgements are superordinate constructs in our systems which control moods.

In the review of literature in which mood level was used as a covariate, mood level relationships with variables in these studies were frequently significant. Patterns of relationships were often clarified when the effects of mood on independent and dependent variables were taken into account. The work of Nadien, Schaeffer, and Schmeidler (1969) was not reviewed when the data were collected for this study. They found that students in positive moods had high correlations between reading speed and comprehension; students in negative moods did not. They recommended mood

assessment as a part of experimental investigations. The present investigation could have been improved by collecting mood data during the session in which ACR and CC data were collected. If there were significant relationships among ACR, CC, and test session mood level, the effects of mood level could have been "held constant" through the use of partial correlations, in the relationships among ACR, CC, and the means and standard deviations of the mood data. Affective Complexity and Cognitive Complexity were hypothesized as relatively stable aspects of personality that will change slightly as new experiences are construed and integrated into our personal systems for understanding the world. However, it was also assumed that mood level can have significant effects on a subject's performance on tasks designed to measure Affective and Cognitive Complexity. Students with very high or very low mood levels may find it difficult to keep full attention on the task at hand.

One obvious improvement for this study involves factor analyzing the mood data with and without ACR and CC. These analyses could then provide a direct test between the ACR measure proposed here and the AC measure of Wessman and Ricks (1966) and Gorman and Wessman (1975).

The number and kind of analyses appropriate for these data seem limited only by the imagination and computer budget of the investigator. Over 100,000 data points were recorded. Subsequent analyses generated 180 new variables and over 12,000 new data points; it has been jokingly

suggested, that these data be donated to a psychology department as an eternal data pool. At the risk of under-analyzing the data, only the most relevant analyses were presented here so that meaningful comparisons could be made with the Wessman and Ricks data.

It is clear that more research is required to discover the relationships between personality and mood. The affective complexity measure designed for this study may be a valuable addition to the measure proposed by Wessman and Ricks (1966). Like their measure, ACR related to mood variability measures in men but not in women. ACR has the advantage over the AC of Wessman and Ricks in being completely independent of the mood variability data. Perhaps it will be useful in future investigations of affective structure and mood.

APPENDIX A

Cover Sheet For First Experimental Session

FEELINGS AND MOOD STUDY

First, let me thank you for participating in this study. I really appreciate your help. Now, on to the details of the study. This packet contains:

1. Affective Grid (1¼ hours)
2. Situations Grid (15 minutes)
3. Personal Grid (15 minutes)
4. Personal Feeling Scales with Daily Records

We will complete the first three tests during this two hour session. You will note that the times allotted for the first three grids add up to one hour and forty-five minutes. You will have to work rapidly to do this but please take enough time to accurately reflect your feelings on these tasks. If you have any questions or difficulties please raise your hand and I will assist you. Please begin the first grid.

APPENDIX B

Affective Grid

INSTRUCTIONS

This inventory comprises three parts: (1) AFFECTIVE GRID, (2) AFFECTIVE GRID OVERLAY SHEET, and (3) this set of INSTRUCTIONS. It is designed to help the examiner to understand you and some of the people who have played a part in your life.

1. Start with the OVERLAY SHEET. Beginning with your own name, write the first names of the persons described. Write their names in the blanks provided. If you cannot remember a person's name, write his last name or something about him which will clearly bring to your mind the person's identity. You may keep this OVERLAY SHEET. The examiner will be interested only in what you write on the GRID.

2. Next, lay the OVERLAY SHEET sidewise across the top of the GRID so that the numbered blanks correspond to the numbered columns in the GRID. Note that the letters "M" and "F" appear at the heads of columns 10 and 19 inclusive. If the person whose name appears at the top of column 10 is a man, encircle the "M"; if it is a woman, encircle the "F." Do the smae in the remaining columns.

3. Now move the OVERLAY SHEET down on the GRID until it is just above the first row of squares. Note that the three squares at the extreme right have circles in them. This means that you are first to consider the three people whose names appear on your OVERLAY SHEET in the last three columns--columns 19, 18, and 17. Think about these three people. Are two of them alike in the way they make you feel that distinguishes them from the third person? Keep thinking about them until you remember the important way in which two of them are alike and which sets them off from the third person in the way they make you feel.

When you have decided which two it is, and the important way in which they are alike in the way you feel, put an "X" in the two circles corresponding to the two who are alike. Do not put any mark in the third circle.

Now write in the blank under "Construct" the word or short phrase that tells how these two are alike in the way they make you feel.

Next write in the blank under "Contrast" what you consider to be the opposite of this feeling.

4. Now consider each of the other sixteen persons whose names appear at the heads of columns 1 to 16. In addition to the persons whom you have marked with an "X", which ones also make you feel this way? Put a check mark (✓)--not an "X"--under the name of each other person who makes you feel this way.

5. Now slide the OVERLAY SHEET down to the second row. Think about persons number 14, 15, and 16--the three who have circles under their names. In what important way are two of these distinguished from the third in the way they make you feel? Put "Xs" in the circles to show which two are alike. Write the "Construct" and the "Contrast" in the blanks at the right just as you did before. Then consider the other sixteen persons. Check (✓) the ones who also make you feel this way.

6. Complete the test in the way you have done the first two rows. Write your name, age, and the date on the GRID SHEET and give it to the examiner.

OVERLAY SHEET

1. Write your own name in the first blank here.

2. Write your mother's first name here. If you grew up with a stepmother, write her name instead.

3. Write your father's first name here. If you grew up with a stepfather, write his name instead.

4. Write the name of your brother who is nearest your own age. If you had no brother, write the name of a boy near your own age who was most like a brother to you during your early teens.

5. Write the name of your sister who is nearest your own age. If you had no sister, write the name of a girl near your own age who was most like a sister to you during your early teens.

FROM THIS POINT ON DO NOT REPEAT ANY NAMES. IF A PERSON HAS ALREADY BEEN LISTED, SIMPLY MAKE A SECOND CHOICE.

6. Your wife (or husband) or, if you are not married, your closest present girl (boy) friend.

7. Your closest girl (boy) friend immediately preceding the person mentioned above.

8. Your closest present friend of the same sex as yourself.

9. A person of the same sex as yourself whom you once thought was a close friend but in whom you were badly disappointed later.

10. A person with whom you have been associated who, for some unexplained reason, appeared to dislike you.

11. A person whom you would most like to help or for whom you feel sorry.

12. A person with whom you usually feel most uncomfortable.

13. A person whom you have recently met whom you would like to know better.

14. The teacher who influenced you most when you were in your teens.

15. The teacher whose point of view you have found most objectionable.

16. An employer, supervisor, or officer under whom you served during a period of great stress.

17. The most successful person whom you know personally.

18. The happiest person whom you know personally.

19. The person known to you personally who appears to meet the highest ethical standards.

APPECTIVE GRID

1 SE	2 MO	3 FA	4 BR	5 SI	6 SP	7 XP	8 FA	9 XP	10 MF RP	11 MF PP	12 MF UP	13 MF AP	14 MF AT	15 MF RT	16 MF BO	17 MF SP	18 MF HP	19 MF EP	SORT NO.	NAME	AGE
																				DATE	NUMBER
																				CONSTRUCT	CONTRAST
													○	○	○				1		
									○	○		○							2		
					○	○	○												3		
	○	○	○										○				○		4		
				○															5		
				○				○											6		
		○													○	○			7		
			○						○					○					8		
				○					○					○					9		
				○						○		○							10		
			○					○				○							11		
					○												○		12		
	○				○	○													13		
		○			○	○													14		
							○	○					○						15		
○			○	○											○	○		○	16		
	○	○									○								17		
○										○			○						18		
							○		○	○									19		
						○		○											20		
																			21		
○																			22		

APPENDIX C

Desirability Check

Now that you have finished this first grid I would like you to go back and look at your constructs and contrasts. Place a check mark beside the word or phrase in each pair which you consider most desirable. For example, if your construct is happy and it's contrast is sad, and happy is the most desirable feeling for you, you would place a check mark beside happy. Do this for each of the 22 pairs. After you have completed this, please go on to the next grid. Keep your OVERLAY SHEET for use with the next GRID.

APPENDIX D

Situations Grid

SITUATIONAL RESOURCES REPERTORY TEST

INSTRUCTIONS

This test is composed of three parts: (1) AFFECTIVE GRID, (2) AFFECTIVE GRID OVERLAY SHEET, and (3) this set of INSTRUCTIONS.

A. Start with the OVERLAY SHEET you filled out for the AFFECTIVE GRID. Place it at the top of the GRID as you did before.

B. The next step is to finish filling out the grid. Everyone faces some personal problems at one time or another in his life. Here are some very general types of problems that everyone comes up against in one way or another.

1. Think of the time in your life when you had the greatest difficulty understanding how to get along with people of the opposite sex. Write the year when it happened in the first blank under "Construct" on the AFFECTIVE GRID. Now write the place where it happened, just to the right under "Contrast." This is to help you identify the incident later in the test.

Now suppose each of the nineteen people whose names you have written at the tops of the columns of the grid had been around at that time. Which ones, if any, do you feel you could have turned to for help? Put an "X" below each of their names in the first row of squares opposite the date and place. If you depended heavily on yourself put an "X" in the box under your name.

2. Next, think of the time in your life when you were most hard up financially. Write the year and place in the second row. Then put an "X" in the second row under each person you feel you might have turned to for help if he had been there.

NOW YOU CAN GO ON TO THE REST OF THE ITEMS. DO NOT REPEAT SITUATIONS. IF A SITUATION HAS ALREADY BEEN LISTED SIMPLY MAKE A SECOND CHOICE.

3. The time when you were in poorest health or had a long period of sickness.

4. The time when someone took advantage of you because you did not know what you were doing.

5. The time when you wondered if you would not be better off dead or when you came nearest feeling that way.

6. The time when you lost ybur temper or got very angry.

7. The time when you hurt someone's feelings in a way he or she did not deserve.

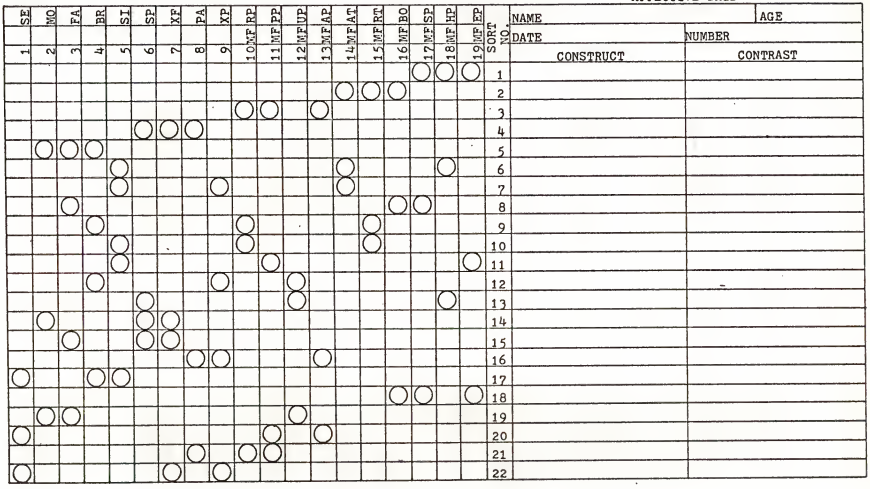
8. The time when you felt most ashamed of yourself.

9. The time when you were most frightened or fearful about what might become of you.

10. The time in recent years when you acted childish.

11. The time when you felt jealous of someone's affection.

NOW GO BACK OVER THE ELEVEN SITUATIONS YOU HAVE LISTED AND PUT A CHECK MARK (✓) OPPOSITE THE FIVE WHICH HAVE CAUSED YOU THE MOST WORRY DURING YOUR LIFE.


AFFECTIVE GRID
NAME
AGE
DATE
NUMBER
CONSTRUCT
CONTRAST
SORT NO.
1 SE
2 NO
3 FA
4 BR
5 SI
6 SP
7 XF
8 PA
9 XP
10 MF RP
11 MF PP
12 MF UP
13 MF AP
14 MF AT
15 MF RT
16 MF BO
17 MF SP
18 MF HP
19 MF EP

APPENDIX E

Bieri Grid

INSTRUCTIONS

This inventory comprises three parts: (1) a RATING GRID, (2) an OVERLAY SHEET, and (3) this set of INSTRUCTIONS. This inventory is designed to help the experimenter understand the way people think about people who have played a part in their lives.

1. Start with the OVERLAY SHEET. The numbers in parentheses refer to the people you used on the first OVERLAY SHEET. Write their names in the blanks provided. Note that for number ten (10) (the person you find difficult to understand) you will have to think of a person who fits this description. DO NOT USE THE NAME OF ANY PERSON NAMED IN THE FIRST NINE BLANKS. You may keep this OVERLAY SHEET. The experimenter will be interested only in what you write on the RATING GRID.

2. Next, lay the OVERLAY SHEET sidewise across the top of the RATING GRID so that the numbered blanks correspond to the numbered columns in the GRID where the brief descriptions of the persons are listed.

3. Now move the OVERLAY SHEET down on the RATING GRID until it is just above the first row of squares. Note that out to the side of the first row of squares is a scale or dimension labeled outgoing-shy. The six numbers along the top of the words refer to the six points along this scale. +3 indicates very outgoing; +2 indicates moderately outgoing; +1 indicates slightly outgoing; -1 indicates slightly shy; -2 indicates moderately shy; and, -3 indicates very shy.

4. Now, rate each of the ten people you have listed in the blanks of the OVERLAY SHEET on this scale. Place one of the six numbers in the square under each name. For example, if you rate the person you have placed in column 2 (disliked person) as moderately outgoing, you would place a +2 in the square under his (her) name.

5. Now slide the OVERLAY SHEET down to the second row. Note that out to the side of the second row is a scale labeled adjusted-maladjusted. Rate each of the ten people you have listed along this six point scale by placing num-

bers in the squares of the second row.

6. Complete the other rows in the way you have done the first two rows. When you have finished, you may destroy or keep this OVERLAY SHEET as well as the first on you filled out. Please go on to the next page.

OVERLAY SHEET

_____	1 (1)	Write your name in the first blank here.
_____	2 (9)	A person with whom you have been associated and for some reason you dislike.
_____	3 (2)	Write your mother's name here. If you grew up with a stepmother, write her name instead.
_____	4 (11)	A person whom you would most like to help or for whom you feel sorry.
_____	5 (3)	Write your father's name here. If you grew up with a stepfather, write his name instead.
_____	6 (8)	Your closest present friend of the same sex as yourself.
_____	7 (6)	Your wife (husband) or, if you are not married, your closest present girl (boy) friend.
_____	8 (12)	A person with whom you usually feel most uncomfortable.
_____	9 (16)	An employer, supervisor or officer under whom you served during a period of great stress.
_____	10	A person whom you find difficult to understand.

RATING GRID

											Brief Description of Columns
Row 1											1 Yourself
											Person you 2 dislike
Row 2											3 Mother
											Person you'd like 4 to help
Row 3											5 Father
											Friend of same 6 sex
Row 4											Friend of opposite 7 sex
											Person you feel 8 uncomfortable with
Row 5											9 Boss
											Person difficult 10 to understand
Row 6											
Row 7											
Row 8											
Row 9											
Row 10											

+3	+2	+1	-1	-2	-3
outgoing			shy		
adjusted			maladjusted		
decisive			indecisive		
calm			excitable		
interested in others			self-absorbed		
cheerful			ill humored		
responsible			irresponsible		
considerate			inconsiderate		
independent			dependent		
interesting			dull		
+3	+2	+1	-1	-2	-3

APPENDIX F

Appreciation and Invitation Sheet

You have just completed Phase I of the study. You had a lot to do but I think the information you provided is very important for learning about feelings. Thank you very much for participating in my study.

You have just earned two hours of experimental credit for Phase I of the Feelings and Moods project. The last packet in the stack contains the materials you will need for daily rating of your moods. The 201 students will receive at least three additional hours credit for participation in Phase II and more if it can be arranged. It is this part of the study that will provide some very much needed information on moods. When coupled with the results from Phase I, this information will be even more valuable. If you wish to participate in Phase II, keep the last packet and take it home in the envelope. Gather your other materials together and give them to me. If you do not wish to participate in Phase II, put all of your materials in the envelope and turn them in. In either case, you may keep your two overlay sheets.

APPENDIX G

Cover Sheet for Mood Ratings

PERSONAL FEELING SCALES

Instructions - The Personal Feeling Scales are an attempt to give you a systematic way of telling me about your feelings. They will not always fit your feelings exactly but I want you to pick the statements in each scale that best reflect your feelings.

Please look at the Daily Record Sheet. Please fill this out each night before retiring so that your ratings will reflect your feelings for the whole day even though they may have been experienced for only a few moments.

You will also note that there is a request for additional comments. You may use the back of the sheet for these. Such comments might include detailed explanations of feelings, suggestions about the scales, and important events in your life which may effect your feelings such as exams, dates, current events, etc. Any comments like these will be very valuable in understanding your ratings.

Some of the Daily Record Sheets are incomplete. On these sheets, no place was provided for the date. Please put the date in the upper right hand corner.

It is very important that you fill out these Daily Records each evening or the following morning at the latest. I suggest you keep your record sheets in some conspicuous place so that you will remember them each night or tape a reminder to your clock or light switch.

The Daily Records will be turned in the following day by 4 P.M. As often as possible, I or one of my two assistants will come to your 201, 306, or 309 classroom to collect Records before or after class. If no one is there you may turn in your sheets at 155 Building E by 4 P.M. It is very important that you turn in your Records every day.

Credit - Since the Record takes about five or ten minutes a night to complete, I will give one hour of credit per seven days of ratings. You must complete at least 21 days to receive the three hours credit for Phase II. Those people completing less than 21 days of ratings will receive no credit. I will give one additional hour of credit for each additional seven days of ratings.

I realize that occasionally it will be impossible for you to fill out the Record. I will allow two misses without penalty. For each additional miss or late turn in,

you will lose one-half hour of credit. I would like to give you as much credit as possible so please turn your Records in promptly the day after you fill them out.

If you have any questions about the rating procedure please feel free to call me or stop by my office, Building E 155, 392-0690, or call me at home, 376-2764. Any comments or suggestions would be welcomed so please feel free to stop by or call me.

Jack E. Schaff

APPENDIX H

Wessman and Ricks Personal Feeling Scales

PERSONAL FEELING SCALES

I. Fullness vs. Emptiness of Life (how emotionally satisfying, abundant or empty, your life felt today)

10. Consummate fulfillment and abundance.
9. Replete with life's abundant goodness.
8. Filled with warm feelings of contentment and satisfaction.
7. My life is ample and satisfying.
6. Life seems fairly adequate and relatively satisfying.
5. Some slight sense of lack, vague and mildly troubling.
4. My life seems deficient, dissatisfying.
3. Life is pretty empty and barren.
2. Desolate, drained dry, impoverished.
1. Gnawing sense of emptiness, hollowness, void.

II. Receptivity towards and Stimulation by the World (how interested and responsive you felt to what was going on around you)

10. Passionately absorbed in the world's excitement. My sensations and feelings incredibly intensified.
9. Tremendously stimulated. Enormously receptive.
8. Senses lively. Great interest and delight in everything around me.
7. Open and responsive to my world and its happenings.
6. Moderately interested and fairly responsive.
5. Slightly disinterested and unresponsive.
4. Bored. Life pretty monotonous and uninteresting.
3. Dull and apathetic. Almost no interest or desire for anything.
2. Mired down in apathy. My only desire is to shut out the world.
1. Life is too much trouble. Sick of everything, want only oblivion.

III. Social Respect vs. Social Contempt (how you felt other people regarded you, or felt about you today)

10. Excite the admiration and awe of everyone who matters.
9. Stand extremely high in the estimation of people whose opinions count with me.
8. People I admire recognize and respect my good points.
7. Confident that some people think well of me.
6. Feel I am appreciated and respected to some degree.
5. Some people don't seem to see much value in me.
4. I am looked upon as being of small or of no account.
3. People have no respect for me at all.
2. I am scorned, slighted, pushed aside.
1. Everyone despises me and holds me in contempt.

IV. Personal Freedom vs. External Constraint (how much you felt you were free or not free to do as you wanted)

10. Absolutely free to consider and try any new and adventuresome prospect.
9. Independent and free to do as I like.
8. Ample scope to go my own way.
7. Free, within broad limits, to act much as I want to.
6. Can do a good deal on my own initiative and in my own fashion. No particularly restrictive limitations.
5. Somewhat constrained and hampered. Not free to do things my own way.
4. Checked and hindered by too many demands and constraints.
3. Hemmed in, cooped up. Forced to do things I don't want to do.
2. Trapped, oppressed.
1. Overwhelmed, smothered. Can't draw a free breath.

V. Harmony vs. Anger (how well you got along with, or how angry you felt toward other people)

10. Boundless good will and complete harmony.
9. Enormous good will and great harmony.
8. Considerable good will.
7. Get along well and rather smoothly.
6. Get along pretty well, more or less good feeling.
5. A little bit annoyed, somewhat "put out." Minor irritations.
4. Annoyed, irritated, provoked.
3. Very angry. Ill will.
2. Enraged. Seething with anger and hostility.
1. Violent hate and fury. Desire to attack, destroy.

VI. Own Sociability vs. Withdrawal (how socially outgoing or withdrawn you felt today)

10. Immensely sociable and outgoing.
9. Highly outgoing, congenial and friendly.
8. Very sociable and involved in things.
7. Companionable. Ready to mix with others.
6. Fairly sociable. More or less accessible.
5. Not particularly outgoing. Feel a little bit unsociable.
4. Retiring, would like to avoid people.
3. Feel detached and withdrawn. A great distance between myself and others.
2. Self contained and solitary.
1. Completely withdrawn. Want no human contact.

VII. Companionship vs. Being Isolated (the extent to which you felt emotionally accepted by or isolated from other people)

10. Complete participation in warm, intimate friendship.
9. Enjoy the warmth of close companionship.
8. Thoroughly and genuinely liked.
7. Feel accepted and liked.
6. More or less accepted.
5. Feel a little bit left out.
4. Feel somewhat neglected and lonely.
3. Very lonely. No one seems to care much about me.
2. Tremendously lonely. Friendless and forlorn.
1. Completely isolated and forsaken. Abandoned. Ache with loneliness.

VIII. Love and Sex (the extent to which you felt loving and tender, or sexually frustrated and unloving)

10. Feel the rapture of full, joyous, and complete love.
9. Tremendous gratification, delight, love, and trust.
8. Warm sharing of intimacy and affection.
7. Pleasant companionship and some affection. Sharing interests and good times.
6. Fairly satisfying experiences or expectations. Some mutual interest and understanding.
5. Not much feeling of mutual understanding. Some lack of interest. Slightly frustrated.
4. Little feeling of relationship. Considerable indifference. Moderately frustrated.
3. Feel unable to maintain good relationships. Unloved. Much frustration.
2. Hurt, bewildered, incapable of loving or being loved. Vast amount of frustration.
1. Hopeless, cold, unloved and unloving.

IX. Present Work (how satisfied or dissatisfied you were with your work)

10. Tremendous, intense delight in my work. Proud of my purpose, skill, and accomplishment.
9. Great pleasure and enjoyment in my work. Much fulfillment through work.
8. Considerable satisfaction with my work. Eager to continue.
7. Satisfied with my work. Encouraged to go on with it.
6. More or less satisfied with my work. Keep plugging along.
5. Somewhat dissatisfied with my work. Not much enjoyment doing it.
4. Dissatisfied with my work. Can't see much good in it. Moderately frustrated.
3. Greatly dissatisfied with my work. Not doing a good job. Markedly frustrated.
2. Tremendously dissatisfied and frustrated in my work. Befuddled. Disorganized.
1. Completely dissatisfied and frustrated in my work. Hopeless, useless chaos.

X. Thought Processes (how readily your ideas came and how valuable they seemed)

10. I am a surging torrent of spectacular insights.
9. Brilliant penetrating ideas emerging spontaneously and with great rapidity.
8. Ideas coming quickly and effortlessly.
7. Clever and keen.
6. Quite alert. Thoughts fairly quick and clear.
5. Not particularly alert. My ideas trivial and commonplace.
4. My mind feels ponderous and dull. My thoughts are slow and monotonous.
3. My thoughts all seem weary, stale, flat, and unprofitable.
2. My mind is stagnant. Almost nothing freshens it.
1. My mind is cold, dead. Nothing moves.

XI. Tranquility vs. Anxiety (how calm or troubled you felt)

10. Perfect and complete tranquility. Unshakably secure.
9. Exceptional calm, wonderfully secure and carefree.
8. Great sense of well-being. Essentially secure, and very much at ease.
7. Pretty generally secure and free from care.
6. Nothing particularly troubling me. More or less at ease.

5. Somewhat concerned with minor worries or problems. Slightly ill at ease, a bit troubled.
4. Experiencing some worry, fear, trouble, or uncertainty. Nervous, jittery, on edge.
3. Considerable insecurity. Very troubled by significant worries, fears, uncertainties.
2. Tremendous anxiety and concern. Harassed by major worries and fears.
1. Completely beside myself with dread, worry, fear. Overwhelmingly distraught and apprehensive. Obsessed or terrified by insoluble problems and fears.

XII. Impulse Expression vs. Self-Restraint (how expressive and impulsive or internally restrained or controlled, you felt)

10. Wild and complete abandon. No impulse denied.
9. Exhilarating sense of release. Say whatever I feel, and do just as I want.
8. Quick to act on every immediate desire.
7. Allowing my impulses and desires a pretty free rein.
6. Moderate acceptance and expression of my own needs and desires.
5. Keep a check on most whims and impulses.
4. On the straight and narrow path. Keeping myself within strong bounds.
3. Obeying rigorous standards. Strict with myself.
2. Refuse to permit the slightest self-indulgance or impulsive action.
1. Complete renunciation of all desires. Needs and impulses totally conquered.

XIII. Personal Moral Judgement (how self-approving, or how guilty, you felt)

10. Have a transcedent feeling of moral perfection and virtue.
9. I have a sense of extraordinary worth and goodness.
8. In high favor with myself. Well up to my own best standards.
7. Consider myself pretty close to my own best self.
6. By and large, measuring up to most of my moral standards.
5. Somewhat short of what I ought to be.
4. I have a sense of having done wrong.
3. Feel that I have failed morally.
2. Heavy laden with my own moral worthlessness.
1. In anguish. Tormented by guilt and self-loathing.

XIV. Self-Confidence vs. Feelings of Inadequacy (how self-assured and adequate, or helpless and inadequate, you felt)

10. Nothing is impossible to me. Can do anything I want.
9. Feel remarkable self-assurance. Sure of my superior powers.
8. Highly confident of my capabilities.
7. Feel my abilities sufficient and my prospects good.
6. Feel fairly adequate.
5. Feel my performance and capabilities somewhat limited.
4. Feel rather inadequate.
3. Distressed by my weakness and lack of ability.
2. Wretched and miserable. Sick of my own incompetence.
1. Crushing sense of weakness and futility. I can do nothing.

XV. Energy vs. Fatigue (how energetic, or tired and weary, you felt)

10. Limitless zeal. Surging with energy. Vitality spilling over.
9. Exuberant vitality, tremendous energy, great zest for activity.
8. Great energy and drive.
7. Very fresh, considerable energy.
6. Fairly fresh. Adequate energy.
5. Slightly tired, indolent. Somewhat lacking in energy.
4. Rather tired. Lethergic. Not much energy.
3. Great fatigue. Sluggish. Can hardly keep going. Meager resources.
2. Tremendously weary. Nearly worn out and practically at a standstill. Almost no resources.
1. Utterly exhausted. Entirely worn out. Completely incapable of even the slightest effort.

XVI. Elation vs. Depression (how elated or depressed, happy or unhappy, you felt today)

10. Complete elation. Rapturous joy and soaring ecstasy.
9. Very elated and in very high spirits. Tremendous delight and bouyancy.
8. Elated and in high spirits.
7. Feeling very good and cheerful.
6. Feeling pretty good, "O.K."
5. Feeling a little bit low. Just so-so.

4. Spirits low and somewhat "blue."
3. Depressed and feeling very low. Definitely "blue."
2. Tremendously depressed. Feeling terrible, miserable, "just awful."
1. Utter depression and gloom. Completely down. All is black and leaden.

APPENDIX I

Wessman and Ricks Daily Record of Personal Feelings

Date _____

DAILY RECORD OF PERSONAL FEELINGS

Please fill in completely, 3 ratings on each scale, before retiring every day. Remember to record the "highest" and "lowest" you felt even though they may have been experienced for only a brief moment. The "average" represents your overall summary of the day.

I. Fullness vs. Emptiness
Highest_____
Average_____
Lowest_____

II. Receptivity towards World
Highest_____
Average_____
Lowest_____

III. Social Respect vs. Social Contempt
Highest_____
Average_____
Lowest_____

IV. Personal Freedom vs. Constraint
Highest_____
Average_____
Lowest_____

V. Harmony vs. Anger
Highest_____
Average_____
Lowest_____

VI. Own Sociability vs. Withdrawel
Highest_____
Average_____
Lowest_____

VII. Companionship vs. Being Isolated
Highest_____
Average_____
Lowest_____

VIII. Love and Sex
Highest_____
Average_____
Lowest_____

IX. Present Work
Highest_____
Average_____
Lowest_____

X. Thought Processes
Highest_____
Average_____
Lowest_____

XI. Tranquility vs. Anxiety
Highest_____
Average_____
Lowest_____

XII. Impulse Expression vs. Self-Restraint
Highest_____
Average_____
Lowest_____

XIII. Personal Moral Judgement
Highest_____
Average_____
Lowest_____

XIV. Confidence vs. Feelings of Inadequacy
Highest_____
Average_____
Lowest_____

XV. Energy vs. Fatigue
Highest_____
Average_____
Lowest_____

XVI. Elation vs. Depression
Highest_____
Average_____
Lowest_____

XVII. Physical Health (check one)
6. Excellent _____
5. Good _____
4. Fair _____
3. Rather Poor_____
2. Sick _____
1. Very Sick _____

XVIII. Hours of Sleep Last Night?
_____hours.

XIX. Pressure of Immediate Academic Work
6. None _____
5. Rather light _____
4. Moderate _____
3. Fairly Heavy _____
2. Very Heavy _____
1. Extremely Heavy_____

XX. Please specify nature and quantity of following consumed during the past 24 hours.
a. Medicines and other drugs.
b. Alcohol.

XXI. Detailed comments are very valuable to us. Any observations on how you felt, and why you felt that way will be appreciated.

Please feel free to use the back of this page for questions XX. and XXI.

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BIOGRAPHICAL SKETCH

Jack Edwin Schaff was born May 21, 1943 in Akron, Ohio where he was graduated from John R. Buchtel High School (1961) and the University of Akron with a Bachelor of Arts degree in psychology in 1966 and the Master of Arts degree in psychology in 1967. He was supported during his undergraduate studies by the confidence and funds of his parents, John (deceased) and Elizabeth. During his master's studies he was supported by a grant from the Office of Naval Research and a Teaching Assistantship. Before beginning his Doctoral studies at the University of Florida in 1967 he was employed as a Staff Psychologist (Trainee) at Summit County Receiving Hospital in Cuyahoga Falls, Ohio. While earning dual major concentrations in personality and clinical psychology and a minor concentration in experimental psychology he was awarded a United States Public Health Service Traineeship, a Graduate Teaching Assistantship, and was appointed as a Graduate School Pre-Doctoral Fellow. During 1970 and 1971 he completed an APA approved clinical psychology internship at Camarillo State Hospital in Camarillo, California and Oxnard Mental Health Clinic in Oxnard, California. After returning to Gainesville he was

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Franz R. Epting, Chairman
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Harry A. Grater, Jr., Co-Chairman
Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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August, 1975

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